

Environmental Assessment
Wing Infrastructure Development Outlook
(WINDO) Implementation Plan (FY 04-06)
Volume 1

Beale Air Force Base, California

July 2005

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FINDING OF NO SIGNIFICANT IMPACT (FONSI)

1.0 NAME OF THE PROPOSED ACTION

Wing Infrastructure Development Outlook (WINDO) Implementation Plan at Beale Air Force Base (AFB), California: Volume 1.

Background. The purpose of the WINDO Implementation Plan at Beale AFB is to improve the facility planning process, capture the Wing Commander's vision of what infrastructure improvements are necessary to support the base's on-going mission, and link the Base General Plan to individual funding programs such as Military Construction (MILCON); Operations and Maintenance (O&M), Sustainment, Restoration, and Modernization for Contract (SRMC); Environmental Restoration Account (ERA); Defense Energy Systems Command (DESC); Anti-Terrorism/Force Protection (AT/FP); Quality of Life (QOL), Army & Air Force Exchange Service (AAFES), and other programs to provide a solid plan that both the base and Air Combat Command (ACC) agree upon and understand.

The objective of this Environmental Assessment (EA) is to disclose and analyze potentially significant environmental impacts expected from implementation of Beale AFB's WINDO Implementation Plan and development projects and long-term mission-based actions which comprise the plan (the Proposed Action). A secondary objective of this EA is to determine the potential cumulative impacts from Beale AFB's mission base-wide.

Eighty-seven projects were evaluated under the WINDO Implementation Plan. All WINDO Implementation Plan projects were verified to determine if they qualified for a categorical exclusion (CATEX), were evaluated in an EA with a signed Finding of No Significant Impact (FONSI), or are currently being evaluated in a separate EA. All projects not determined to be in these categories were determined to be proposed projects. All proposed projects were further evaluated to determine if they qualified for a CATEX or if they required further analysis in an EA. In order to expedite the EA timeline, those WINDO projects requiring further analysis in an EA were divided into two categories:

- EA Volume 1 - those projects with no potential to impact to 100-year floodplain and/or wetlands and threatened and endangered species habitat; and
- EA Volume 2 - those projects potentially impacting 100-year floodplain and/or wetlands and threatened and endangered species habitat.

Below is a summary of these 88 WINDO Implementation projects.

- | | |
|---|-------------|
| • Approved as a CATEX: | 17 projects |
| • Approved as an EA with a signed FONSI: | 13 projects |
| • Proposed to qualify for an USAF CATEX: | 37 projects |
| • Proposed, needing further analysis in an EA (Volume 1): | 9 projects |
| • Proposed, needing further analysis in an EA (Volume 2): | 11 projects |

2.0 DESCRIPTION OF PROPOSED ACTION AND NO ACTION ALTERNATIVES

Proposed Action. The Proposed Action consists of nine projects. These nine projects (construction, demolition, and renovation) are listed below. No changes in personnel requirements or aircraft operations would occur.

- Demolition of motor gasoline (MOGAS) Storage Tanks 491 to 499;
- Construction of a running path at O'Malley Field;
- Construction of a liquid oxygen (LOX) storage facility;
- Construction of a maintenance/administration facility;
- Construction of a mobility equipment storage facility;
- Construction of a shopette gas service station and car wash;
- Demolition of Building 5800;
- Construction of a 2-Bay Pre-Flight Hangar; and
- Construction of a consolidated storage facility.

No Action Alternative. Under the No Action Alternative, Beale AFB would continue to use its facilities and infrastructure in its current condition and configuration. This alternative would not address the mission, security, and safety requirements of the ACC and Beale AFB, or meet the standards specified in Unified Facilities Criteria 4-010-01.

3.0 SUMMARY OF ENVIRONMENTAL EFFECTS

Air Quality. There would be no significant effects on regional or local air quality from the Proposed Action. There would be a temporary increase in construction-related emissions during project construction. The Proposed Action would generate emissions well below conformity *de minimis* limits as specified in 40 Code of Federal Regulations (CFR) Part 93.153. Because the emissions generated would be below *de minimis* levels, it is reasonable to assume that the temporary construction emissions caused by the Proposed Action would not cause a violation of the National Ambient Air Quality Standards (NAAQS), and a full Conformity Determination would not be required.

Biological Resources. Implementation of the Proposed Action would result in a small loss of nonnative grassland habitat during construction. Due to the abundance of comparable grassland habitat in the surrounding area, the low loss of grassland habitat would not have an adverse impact on grasslands on Beale AFB. Therefore, no adverse effects on annual grassland habitat would occur from implementation of the Proposed Action. No threatened or endangered species or wetlands are located within the project area.

Geological Resources. There would be no significant effects on geological resources as a result of implementation of the Proposed Action. The effects on soil erosion and sedimentation from construction activities are considered minor because erosion and sediment controls would be in place during construction to reduce and control siltation or erosion impacts to areas outside of the construction site.

Water Resources. There would be no significant effects on surface waters or groundwater as a result of the Proposed Action. The effects from minor increases in storm water runoff could lead to erosion, transfer of pollutants, or flooding; however, these effects would not be substantial.

Hazardous Waste Management. There would be no significant effects on hazardous materials and waste management due to implementation of the Proposed Action. Minor amounts of hazardous waste would be generated during project construction. In addition, the Proposed Action is within or in close proximity to four Environmental Restoration Program (ERP) sites: D-23, Ninth Transportation Refueling Vehicle Maintenance Shop; SD-32, Building 1086; ST-18, Bulk Fuel Storage Facility; and ST-22, Underground Storage Tanks (Basewide). Because of the potential threat of contamination from ERP sites during construction, it is recommended that a health and safety plan be prepared by the contractor in accordance with Occupational Safety and Health Administration (OSHA) requirements prior to commencement of construction activities. In addition, should contamination be encountered, handling, storage, transportation, and disposal activities would be conducted in accordance with applicable federal, state, and local regulations, Air Force Instructions, and Beale AFB programs and procedures. While working within ERP sites, workers should either be 40-hour Hazardous Waste Operations and Emergency Response (HAZWOPER) trained or should be overseen by a supervisor with OSHA Site Supervisor certification.

Safety. There would be no significant effects on structure or personnel safety due to implementation of the Proposed Action. Implementation of the Proposed Action would slightly increase the short-term risk associated with construction contractors performing work at Beale AFB during the normal workday because the level of such activity would increase. In addition, construction workers could be exposed to buried unexploded ordnance and hazardous wastes during project construction. An ERP waiver approved by HQ ACC is required prior to accomplishing any work on or near a range. 9 CES/CEV staff should be contacted prior to commencement of construction activities to determine if an ERP waiver is required for the Proposed Action for all proposed work on or near range sites and for safety requirements that would need to be followed during construction.

Transportation. There would be no significant effect on transportation due to implementation of the Proposed Action. All road and lane closures would be coordinated with the Security Forces and would be temporary in nature; therefore, no adverse direct or indirect effects on transportation systems would be expected.

4.0 CONCLUSION

Based on the provisions set forth in the Proposed Action, all activities were found to comply with the criteria or standards of environmental quality and coordinated with the appropriate federal, state, and local agencies. The attached EA and a draft of this FONSI were made available to the public on 23 February 2005 for a 15-day review period. All public and agency comments received were addressed in the EA.

5.0 FINDINGS

FONSI. After review of the EA prepared in accordance with the requirements of the National Environmental Policy Act (NEPA), the Council on Environmental Quality (CEQ) regulations, and *Environmental Impact Analysis Process (EIAP)*, 32 CFR Part 989, as amended, I have determined that the Proposed Action would not have a significant impact on the quality of the human or natural environment. An Environmental Impact Statement (EIS) will not be prepared. This decision has been made after taking into account all submitted information, and considering a full range of practical alternatives that would meet project requirements and are within the legal authority of the USAF.


DOMENICK EANNIELLO,, Colonel USAF
Vice Commander

18 JUL 05
Date

ABBREVIATIONS AND ACRONYMS

940 ARW	940th Air Refueling Wing
9 CES/CEV	9th Civil Engineering Squadron/Environmental Flight
940 CES/SVS	940th Civil Engineering Squadron/Services
9 RW	9th Reconnaissance Wing
AAFES	Army & Air Force Exchange Service
ACC	Air Combat Command
ACM	Asbestos Containing Material
AFB	Air Force Base
AFI	Air Force Instruction
AFOSH	Air Force Occupational Safety and Health
AFPD	Air Force Policy Directive
AGS	Aircraft Generation Squadron
AOC	Area of Concern
AQCR	Air Quality Control Region
AT/FP	Anti-Terrorism/Force Protection
CAA	Clean Air Act
CAIS	Chemical Agent Identification Sets
C&D	Construction and Demolition
Cal-EPA	California Environmental Protection Agency
CARB	California Air Resources Board
CATEX	Categorical Exclusion
CBT	Computer Based Training
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CFR	Code of Federal Regulations
CNDDB	California National Diversity Database
CO	Carbon Monoxide
CONEX	Container Express
CRWQCB	California Regional Water Quality Control Board
CY	calendar year
DESC	Defense Energy Systems Command
DOD	U.S. Department of Defense
DTSC	Department of Toxic Substance Control
EA	Environmental Assessment
EIAP	Environmental Impact Analysis Process
EQD	Explosive Quantity Distance
ERA	Environmental Restoration Account
ERP	Environmental Restoration Program
ft ²	square feet
FIP	Federal Implementation Plan
FONSI	Finding of No Significant Impact
FRAQMD	Feather River Air Quality Management District
FY	Fiscal Year
GH	Global Hawk
HAZWOPER	Hazardous Waste Operations and Emergency Response
HQ	Headquarters

INRMP	Integrated Natural Resources Management Plan
LBP	lead based paint
LOX	Liquid Oxygen
MFH	Military Family Housing
mg/m ³	milligrams per cubic meter
MILCON	Military Construction
MOBAGS	Mobility Bags
MOGAS	Motor Gasoline
NAAQS	National Ambient Air Quality Standards
NAVAID	Navigational Aid
NCO	Noncommissioned Officer
NEPA	National Environmental Policy Act
NO ₂	Nitrogen Dioxide
NO _x	Nitrogen Oxide(s)
NRCS	National Resources Conservation Service
NSVAB	Northern Sacramento Valley Air Basin
O ₃	Ozone
O&M	Operations and Maintenance
OSHA	Occupational Safety and Health Administration
PAVE PAWS	Perimeter Acquisition Vehicle Entry Phased Array Warning System
P.L.	Public Law
Pb	Lead
PM ₁₀	Particulate Matter ≤ 10 microns in diameter
PM _{2.5}	Particulate Matter ≤ 2.5 microns in diameter
ppm	parts per million
QOL	Quality of Life
RCRA	Resource Conservation and Recovery Act
SAAQS	State Ambient Air Quality Standards
SFS	Security Forces Squadron
SIP	State Implementation Plans
SO ₂	Sulfur Dioxide
SR	State Route
SRMC	Sustainment, Restoration, and Modernization for Contract
tpy	tons per year
TSP	Total Suspended Particulate
U.S.C.	United States Code
UFC	Unified Facilities Criteria
USACE	U.S. Army Corps of Engineers
USAF	United States Air Force
USEPA	U.S. Environmental Protection Agency
UST	Underground storage tank
UXO	Unexploded ordnance
VOC	Volatile Organic Compound
WINDO	Wing Infrastructure Development Outlook
µg/m ³	micrograms per cubic meter

ENVIRONMENTAL ASSESSMENT
WING INFRASTRUCTURE DEVELOPMENT OUTLOOK
(WINDO) IMPLEMENTATION PLAN (FY 04-06)
VOLUME 1
BEALE AIR FORCE BASE, CALIFORNIA

Beale Air Force Base
Environmental Flight
6601 B Street
Beale Air Force Base, CA 95903-1712

APRIL 2005

**ENVIRONMENTAL ASSESSMENT OF
WING INFRASTRUCTURE DEVELOPMENT OUTLOOK (WINDO) IMPLEMENTATION PLAN (FY 04-06)
AT BEALE AIR FORCE BASE, CALIFORNIA
VOLUME 1**

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1. Introduction

1.1 Background

Beale Air Force Base (AFB) is a United States Air Force (USAF) base under the Air Combat Command (ACC). Beale AFB is headquarters to the 9th Reconnaissance Wing (9 RW). The 9 RW is responsible for providing national and theater command authorities with timely, reliable, high-quality, high-altitude reconnaissance products. To accomplish this mission, 9 RW is equipped with a fleet of U-2 and Global Hawk reconnaissance aircraft and associated support equipment. The wing maintains a high state of readiness in its combat support and combat service support forces for potential deployment in response to theater contingencies. The 9 RW also provides support for Beale AFB, ranging from financial, personnel, housing, maintenance, legal, recreational, and medical needs to fire protection, chaplain services, and base security.

Beale AFB is a 22,944-acre military installation in Yuba County, California, approximately 40 miles north of Sacramento, 13 miles east of Marysville, and 25 miles west of Grass Valley (see Figure 1-1). The base is between the Yuba and Bear Rivers in an area that characterizes the transition from the western Sacramento Valley east to the Sierra Nevada foothills.

1.2 Purpose and Need for the Proposed Action

The purpose of the Wing Infrastructure Development Outlook (WINDO) Plan at Beale AFB is to improve the facility planning process, capture the Wing Commander's vision of what infrastructure improvements are necessary to support the base's on-going mission, and link the Base General Plan to individual funding programs such as Military Construction (MILCON); Operations and Maintenance (O&M), Sustainment, Restoration, and Modernization for Contract (SRMC); Environmental Restoration Account (ERA); Defense Energy Systems Command (DESC); Anti-Terrorism/Force Protection (AT/FP); Quality of Life (QOL), Army & Air Force Exchange Service (AAFES), and other programs to provide a solid plan that both the base and ACC agree upon and understand.

Headquarters (HQ) ACC identified the need to improve base planning and streamline National Environmental Policy Act (NEPA) compliance by preparing fewer, more comprehensive documents. Therefore, they started an initiative called the WINDO Plan. The collective analysis of all appropriate WINDO projects in a single Environmental Assessment (EA) would reduce the overall analysis workload, streamline the NEPA review process, reduce project fractionation, coordinate land use planning, provide

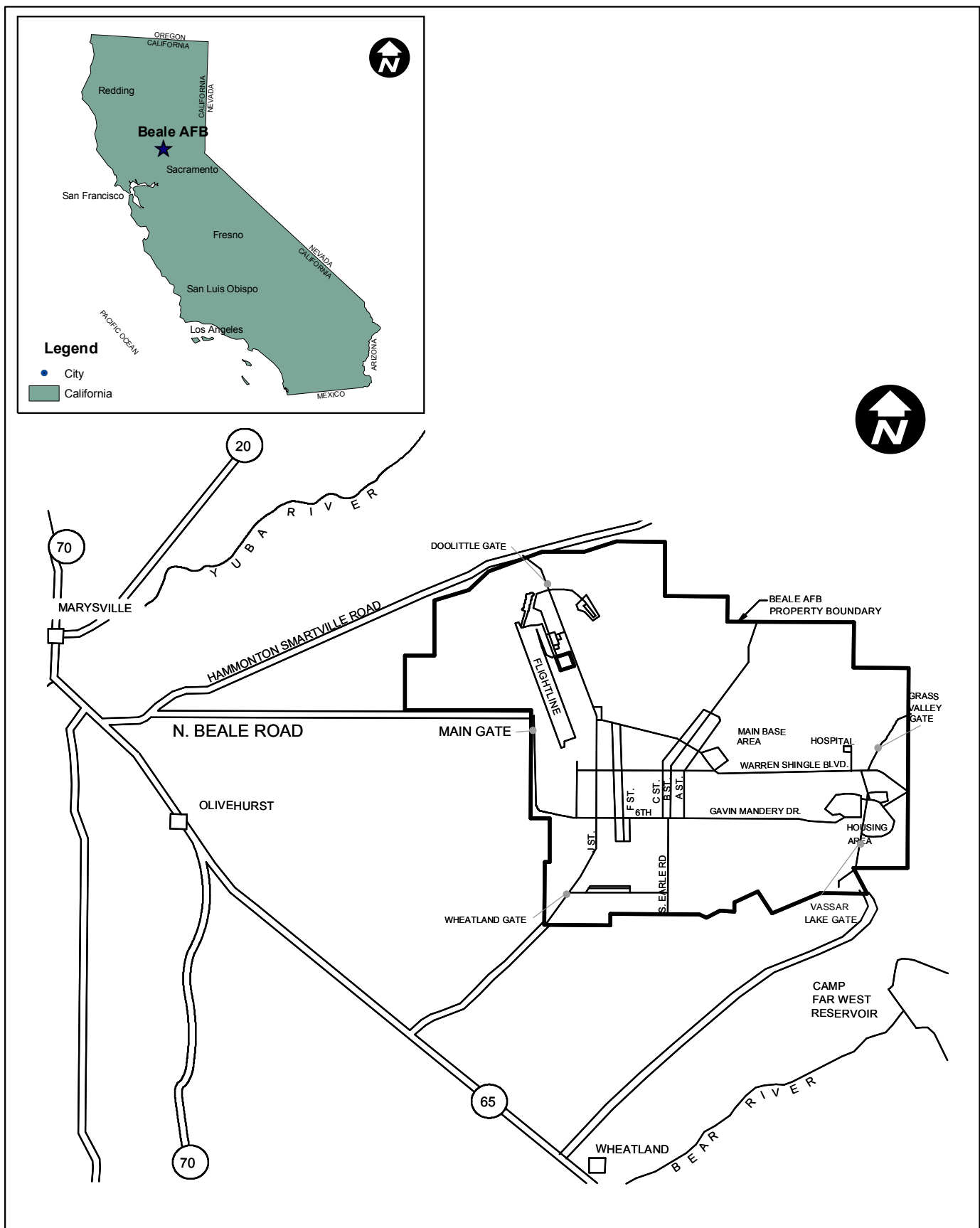


Figure 1-1. Beale AFB and Surrounding Area

cost savings through combining projects and maintaining a baseline for future analysis, tiering, and correct application of categorical exclusions.

1.3 Assessment Approach

The types of activities included in the WINDO plan involve site preparation, construction of new facilities; facility upgrades, repair and alterations of existing facilities and base infrastructure; replacement and expansion of facilities; landscaping, storm drainage system, sewer system and other utilities maintenance and upgrades; AT/FP activities; and demolition of facilities. All projects programmed for implementation during Fiscal Years (FY) 2004 through 2006 were evaluated for Environmental Impact Analysis Process (EIAP) under the WINDO effort. All projects would be located within the boundaries of Beale AFB. There are three categories of actions evaluated during the WINDO EA process:

- **Approved Projects.** NEPA analysis is complete. These projects either qualified as a categorical exclusion [CATEX] or were analyzed in another EA. Although not part of the Proposed Action, they may be referenced in this EA because they will occur within the same timeframe as the Proposed Action and are germane to the evaluation of cumulative environmental impacts.
- **Concurrent Projects.** NEPA evaluation is on-going. These projects are being analyzed in another EA. Although not part of the Proposed Action, they may be referenced in this EA because they will occur within the same timeframe as the Proposed Action and are germane to the evaluation of cumulative environmental impacts.
- **Proposed Projects.** NEPA analysis will be discussed in this EA.

Eighty-seven projects were evaluated under the WINDO Implementation Plan. Each of these projects was analyzed according to the approach criteria stated above. All approved and concurrent projects were verified to determine if they qualified for a CATEX, were evaluated in an EA with a signed Finding of No Significant Impact (FONSI), or are currently being evaluated in a separate EA. All remaining projects were determined to be proposed projects. All proposed projects were further evaluated to determine if they qualified for a CATEX or if they required further analysis in an EA. In order to expedite the EA timeline, those WINDO projects requiring further analysis in an EA were divided into two categories: Those projects with no potential to impact the 100-year floodplain and/or wetlands and threatened and endangered species habitat (WINDO Volume 1) and those projects potentially impacting 100-year floodplain and/or wetlands and threatened and endangered species habitat (WINDO Volume 2). A list of all 87 WINDO Implementation Plan projects by FY, a map showing their general locations, and a brief

project description are provided in Appendix A. Below is a summary of these 87 WINDO Implementation projects.

- Approved as a CATEX: 17 projects
- Approved as an EA with a signed FONSI: 13 projects
- Currently being evaluated under a separate EA: 0 projects
- Proposed to qualify for an USAF CATEX: 37 projects
- Proposed, currently being evaluated in this EA (WINDO Volume 1): 9 projects
- Proposed, currently being evaluated in WINDO EA Volume 2: 11 projects

1.4 Purpose of the Environmental Assessment

The objective of this EA is to disclose and analyze potentially significant environmental impacts expected from implementation of Beale AFB's WINDO Implementation Plan and development projects and long-term mission-based actions which comprise the plan (the Proposed Action). A secondary objective of this EA is to determine the potential cumulative impacts from Beale AFB's mission base-wide.

This EA has been prepared to satisfy the requirements of NEPA (Public Law [P.L.] 91-190, Title 42, United States Code [U.S.C.], Section 4321 et seq.), as amended. NEPA legislated a structured approach to environmental impact analysis that requires federal agencies to use an interdisciplinary and systematic approach in their decision making process. This process evaluates potential environmental consequences associated with a proposed action and considers alternative courses of action. The intent of NEPA is to protect, restore, and enhance the environment through well-informed federal decisions. In addition, this document will be prepared in accordance with Air Force Instruction (AFI) 32-7061, EIAP, Title 32 Code of Federal Regulations [CFR] Section 989), which implements Section 102(2) of NEPA and regulations established by the Council on Environmental Quality (CEQ).

2. Proposed Action and Alternatives

This section describes those projects that will be evaluated as part of the Proposed Action (EA Volume 1) and discusses the No Action Alternative.

2.1 Proposed Action

The Proposed Action consists of nine projects. These nine projects (construction, demolition, and renovation) are listed in Table 2-1. Each of these projects was determined to require analysis in an EA because of the scope of the project, magnitude of the action, and potential impacts associated with the Proposed Action. All nine of these projects are located in four areas of the base: Flightline, Main Base, Industrial (Bulk Fuels), and Military Family Housing (MFH). Each projects location is shown in greater detail in Figures 2-1 to 2-4.

Table 2-1. Projects Analyzed in this EA

Program FY	Project Title	Project Number	Project Type	Area Disturbed
2004	Demolish MOGAS Storage Tanks, 491-499	040025 Ref. No. 25	DESC	17,122 ft ² 0.39 acres
2004	Construct Running Path at O'Malley Field	980022 Ref. No. 37	QOL	1,363,055 ft ² 31.29 acres
2004	Construct LOX Storage Facility	040024 Ref. No. 39	O&M	10,365 ft ² 0.24 acre
2005	Construct 940 ARW AGS Squadron Maintenance and Administration Facility	010085 Ref. No. 62	O&M	5,156 ft ² 0.12 acre
2005	Construct 940 SFS Mobility Equipment Storage Facility	020048 Ref. No. 63	O&M	16,629 ft ² 0.38 acre
2005	Construct Shopette Gas Service Station and Car Wash	4793-03-000001 Ref. No. 64	AAFES	135,524 ft ² 3.11 acres
2006	Demolish NCO Club, Building 5800	060006 Ref. No. 82	O&M	44,848 ft ² 1.03 acres
2006	Construct 2 Bay Pre-flight Hangar	061009 Ref. No. 86	MILCON	21,988 ft ² 0.50 acre
2006	Construct 940 ARW Consolidated Storage Facility	061008 Ref. No. 87	O&M	23,672 ft ² 0.54 acre

AGS Aircraft Generation Squadron
 ARW Air Refueling Wing
 ft² square feet
 MOGAS motor gasoline
 NCO noncommissioned officers
 QOL quality of life

AAFES Army & Air Force Exchange Service
 DESC Defense Energy Systems Command
 LOX liquid oxygen
 MILCON military construction
 O&M operations and maintenance
 SFS Security Forces Squadron

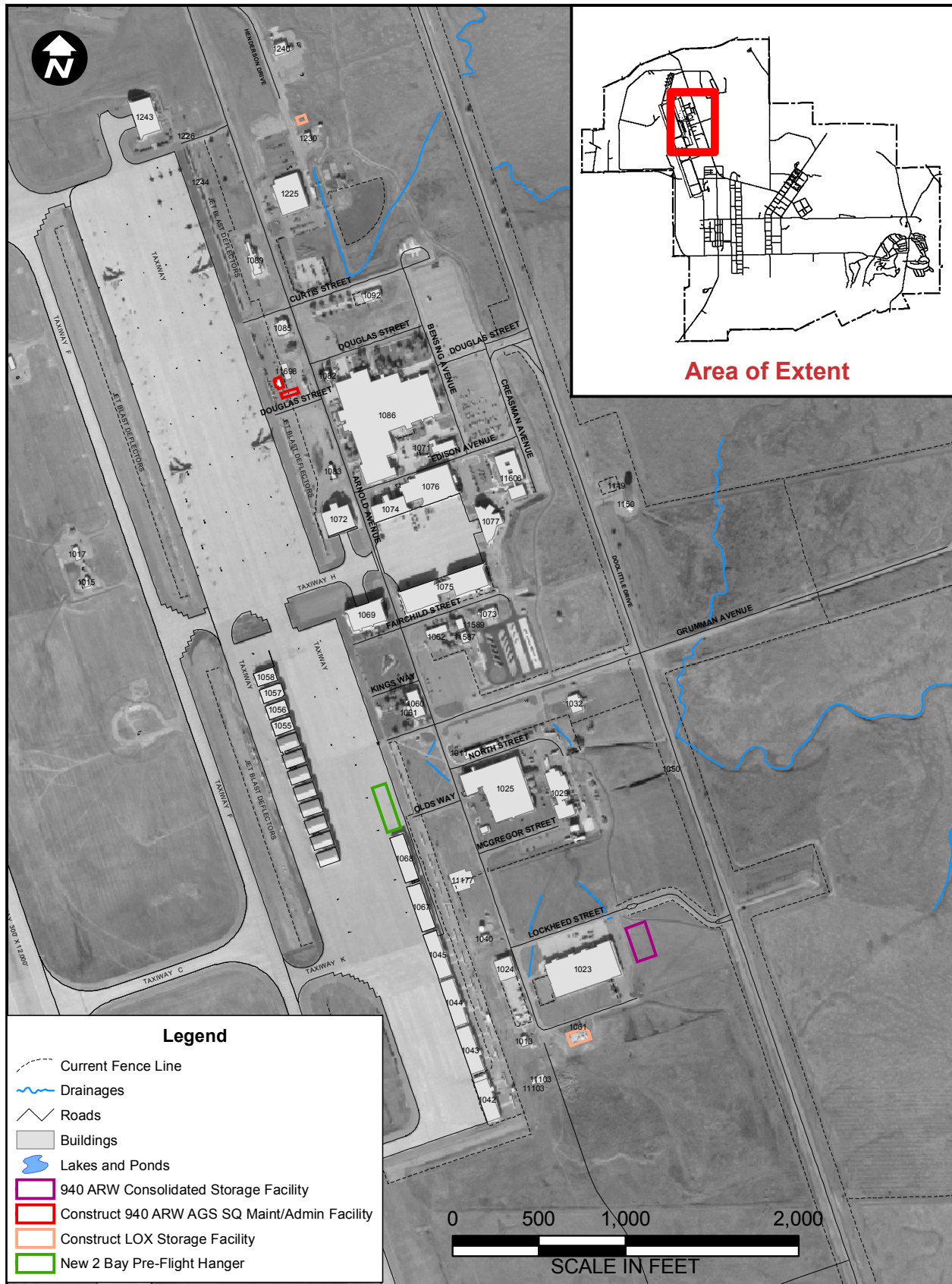


Figure 2-1. WINDO Project Boundaries Near Flightline

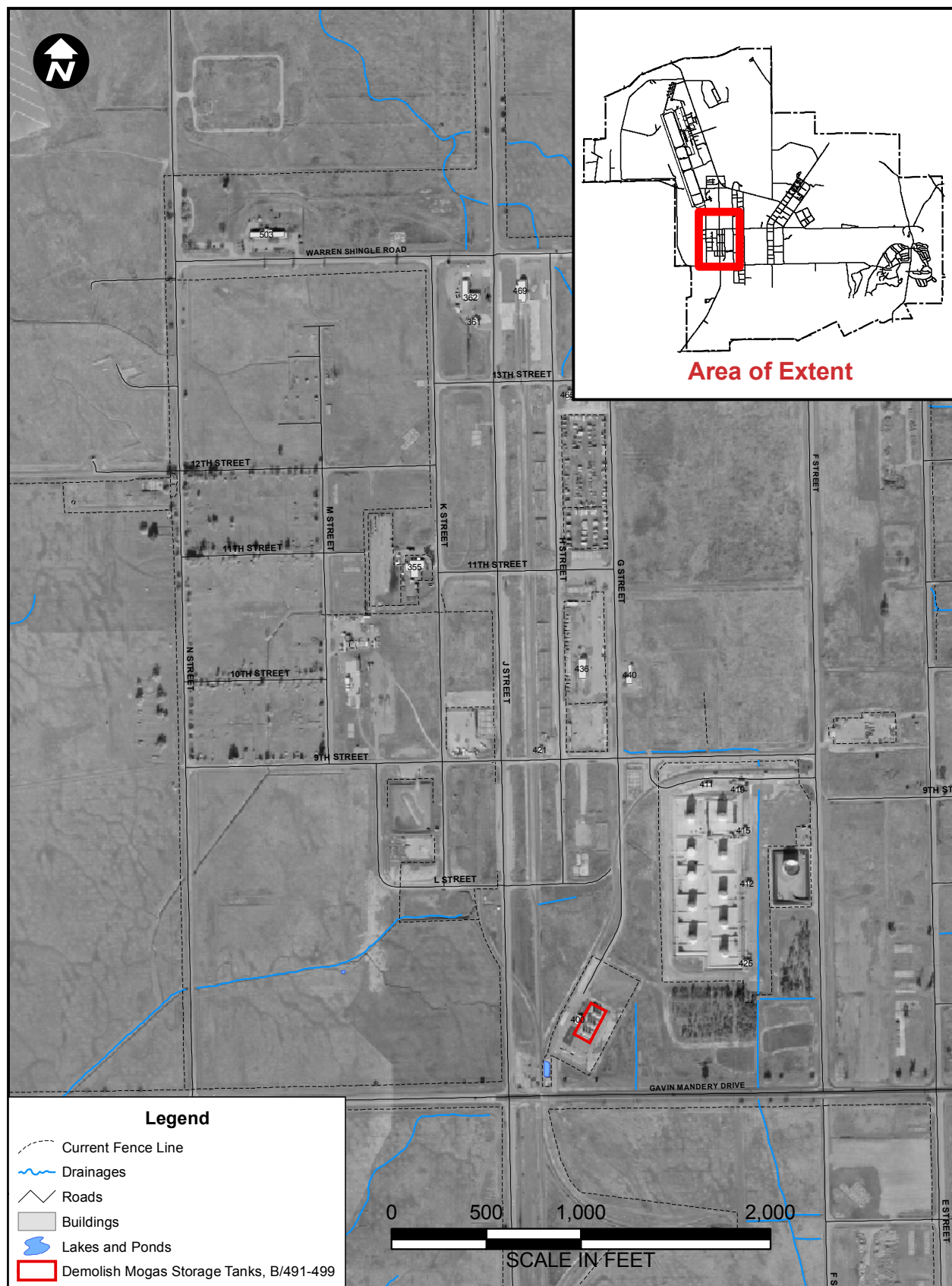


Figure 2-2. WINDO Project Boundaries in Vicinity of Industrial Bulk Fuels Area

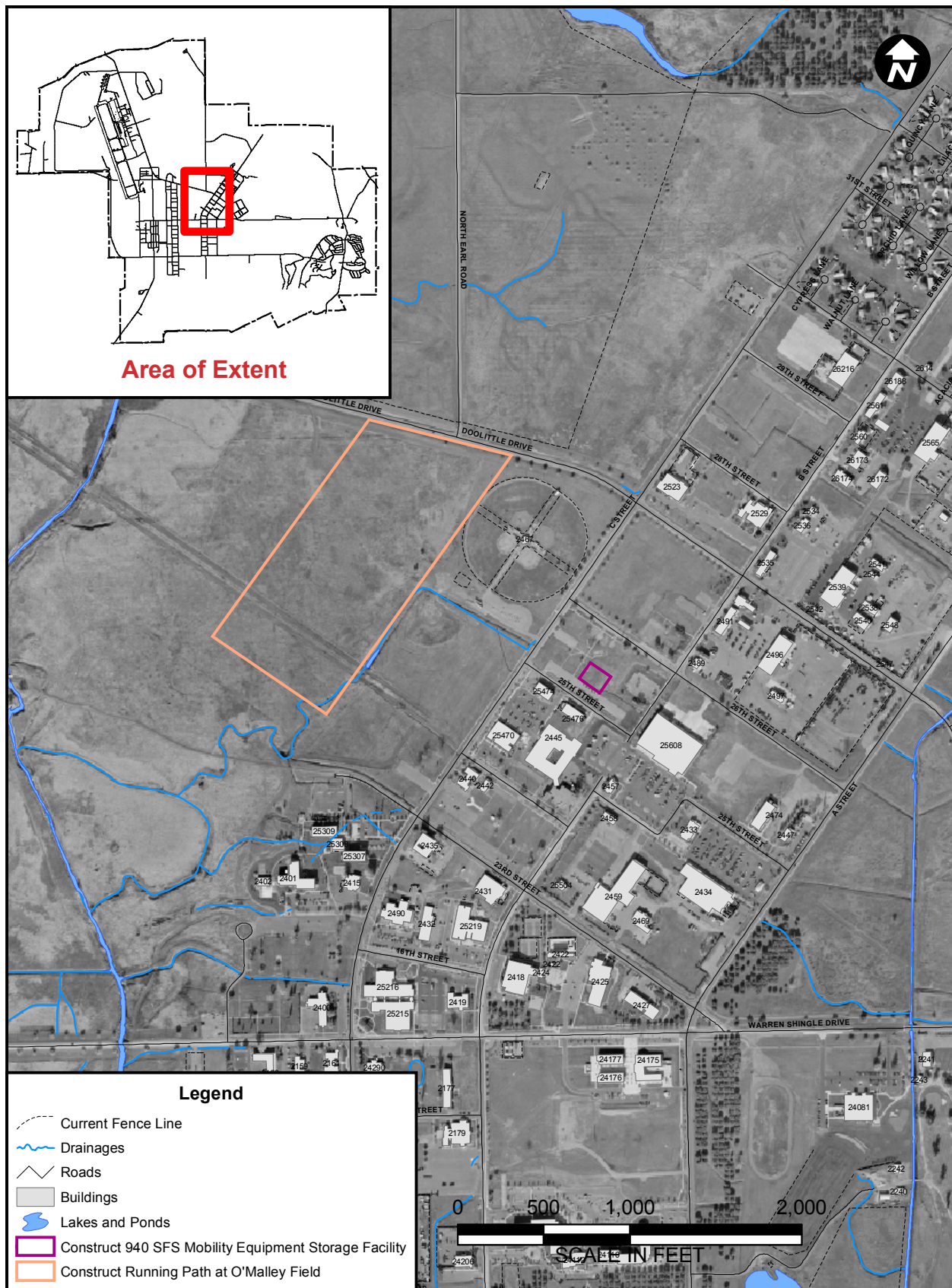


Figure 2-3. WINDO Project Boundaries Near Main Base



2.1.1 Project Descriptions

Demolish Motor Gasoline (MOGAS) Storage Tanks, 491 to 499 (See Figure 2-2). This site is currently used as a ground fuels storage area and is surrounded by an 8-foot cyclone fence. This area includes a rail spur, fuel loading racks and connections, a pump house and distribution pit, nine fuel tanks with concrete secondary containment, fuel truck loading racks, and related-piping. Four of the nine tanks are currently in use to store and distribute diesel #2 and unleaded fuel for use in government vehicles and equipment. Each of the unleaded tanks has a 595 barrel capacity and each of the diesel #2 tanks has a 477 barrel capacity. All of these tanks were constructed in 1953. Commercial trucks deliver fuel to the off-loading racks on the western portion of the facility. Fuel is stored in the tanks and distributed into government refueling trucks through the reloading racks on the south side of the facility. Access to the site is provided from the south via Gavin-Mandery Drive and from the north via the Bulk Fuels access road. These access points are controlled by locked security gates. A soil vapor extraction and treatment system has been operating at this facility (Environmental Restoration Program [ERP] Site 18) for more than five years and would remain in place to remediate solvent contamination.

The MOGAS facility would be closed upon completion of the proposed government gas station near the flightline in the summer of 2005. This site would no longer be required after this gas station is completed. Therefore, these tanks would be demolished including their supporting infrastructure such as fuel storage racks and connections, pump house and distribution pit, secondary containment pad, fuel truck loading racks, and piping. All fuel and vapors would be removed from the MOGAS tanks prior to commencing demolition activities. All fuel-contaminated soils would be removed or treated. The tanks and supporting infrastructure would be disposed of in an approved construction and demolition (C&D) landfill by the contractor.

Construct Running Path at O'Malley Field (See Figure 2-3). Currently, personnel on Beale AFB use the rubberized running track near the Recce Point Club (Building 24081) and existing roadways for running and other exercise-related activities. To enhance the QOL, recreation, and personal training experience of base personnel, a new paved running path with landscaping would be constructed west of the O'Malley baseball fields. The proposed running path would be approximately 5,728 feet long. This proposed running path would help expand the base physical training capability and enhance the O'Malley sports complex. This path is required because new beddown requirements for GH and Deployable Ground Station missions would increase populations on Beale AFB. This would reduce the capability of the base's current infrastructure to support increased fitness program requirements to base personnel.

Construct Liquid Oxygen (LOX) Storage Facility (See Figure 2-1). The current LOX facility consists of a temporary trailer and containment pad surrounded by a chain-link fence, and two 10,000-gallon LOX storage tanks. The current facility cannot adequately support the current administration and mission requirements. In addition, fuel transfer vehicles must transport LOX across the entire length of the flightline or on adjacent roadway to reach their mission destinations. Therefore, the base proposes to remove the LOX trailer from its existing site, construct a level, single-poured concrete containment pad, move the two LOX storage tanks to the new containment area, and construct a 1,200 square feet (ft²) LOX facility. The proposed storage facility is needed for maintenance of equipment required to be certified oxygen clean, prior to use. The project also consists of installing supporting piping for sewage and water. Electricity, water, and security lighting are available on-site. The proposed LOX facility would be constructed in accordance with Air Force Occupational Safety and Health (AFOSH) Standard 91-67 and AFI 23-201 standards and requirements.

Construct 940 ARW Aircraft Generation Squadron (AGS) Squadron Maintenance/Administration Facility (See Figure 2-3). The AGS management and administration are currently separated from flightline operations, creating an inefficient, ineffective organization with degradation to command and control missions of the squadron. Therefore, the base proposes to construct a 3,000 ft² AGS Administration Facility to house the 940 ARW/AGS personnel near the newly constructed AGS facility. Functional areas within this proposed facility would include administrative areas for command staff and the squadron maintenance support flight personnel. Currently, the 940 ARW/AGS personnel are housed in a modular facility on Dock 5. Construction of collocated facilities is essential to creating an efficient and effective command and control of the AGS.

Construction would include preparing the project site, constructing the foundation, and erecting a pre-engineered building to comply with base architectural design standards and connect to existing utilities. Work would include interior partitions, plumbing, electric communications infrastructure, and all other necessary support.

The project site is currently undeveloped and is a disturbed area surrounded by various flightline operations and land uses. The site consists of native and non-native grasses and small areas of disturbed soil. In addition, water drainage from the north flows through the project site into an existing parking lot to the west and then into a storm drain located on the project site. No new parking lots would be required as part of the Proposed Action.

Construct 940 Security Forces Squadron (SFS) Mobility Equipment Storage Facility (See Figure 2-3).

Mobility equipment such as mobility bags (MOBAGS), all terrain vehicles, video equipment, night vision devices, thermal imaging units, and other valuable equipment is stored in an uncovered compound. Equipment left exposed to the elements could become unserviceable if left under current conditions. Therefore, the base proposes to construct a Mobility Equipment Storage Facility with a split block construction to match existing facilities and comply with base architectural design standards. Heating, air, latrine, and phones would be included.

Construct Shoppette Gas Service Station and Car Wash (See Figure 2-4). Currently, AAFES owns and operates a Shoppette Gas Service Station near MFH on the east side of Camp Beale Highway, north of the Vassar Lake Gate. The purpose of this project would be to provide one-stop shopping services in one convenient location to better serve base personnel and visitors. In addition, the project would replace the existing undersized and outdated shopette at Building 3304, provide a much needed POV car wash facility to base personnel, and add another fast food facility. AAFES proposes to construct 8,652 ft² shoppette, which would include convenience retail food service, gasoline service station and pumps, laundry dry-cleaning drop-off/pickup, food service, and 900 ft² carwash. This facility would be located on the west side of Camp Beale Highway north of the Vassar Lake Gate and would be approximately 3 acres. After the proposed facility is constructed, the existing Shoppette Gas Service Station would either be demolished or turned over to the USAF.

Demolish NCO Club, Building 5800 (See Figure 2-4). This 21,916 ft² facility was constructed in 1960 and is currently unoccupied. Building 5800 was used as an NCO club until the new club was constructed in 1999. The current facility is used to store equipment and various other items by Base Services and is used by Security Forces for dog certification classes. In addition to Building 5800, adjacent infrastructure and equipment would be demolished. Existing parking areas would be abandoned in place. C&D waste would be the responsibility of the contractor. All C&D waste would be disposed of in an approved C&D landfill.

Construct 2-Bay Pre-flight Hangar (See Figure 2-1). Currently, there are no excess facilities of adequate size and configuration to support the Global Hawk (GH) maintenance mission at Beale AFB. Therefore, the base proposes to construct a 35,521-ft² two-bay GH maintenance hangar and a 107,639 ft² aircraft parking apron north of Building 1068 on Taxiway J. The hangar would consist of steel frames, masonry walls, standing seam metal roof, concrete floor slab, high expansion foam fire suppression system, utilities, pavements, site improvements, communication support, and remediation of contaminated soil from ERP Sites SD-32 and ST-22 (ACC 2003). The aircraft parking apron would

consist of airfield concrete, aircraft tie-down and grounding points, apron markings, and apron drainage improvements. The hangar would be used to support aircraft maintenance, repair, and inspection activities for the GH mission. The hangar would also be used to store tools, support equipment maintenance, and facilitate aircraft parts receiving shipping and storage, and administration offices. The apron is required to effectively support the new GH mission when it is integrated into the existing base parking areas along the flightline.

Construct 940 ARW Consolidated Storage Facility (See Figure 2-1). The 940 ARW is required by the 9 RW to consolidate its equipment in a single 12,000 ft² building. Currently, the equipment is stored in numerous indoor and outdoor locations around the flightline area. The SR-71 hanger that accounts for a significant amount of 940 ARW storage space is slated for demolition to create room for the GH aircraft. Other major storage facilities are container express (CONEX) boxes that are scattered around the flightline area. GH displaced the 940 ARW Dock 6 operations, which force staff and storage into substantially smaller quarters at the far end of the flightline. Constructing a centralized storage facility would provide 940 ARW with positive oversight protecting valuable equipment, allow centralized control and accountability, and consolidate War Reserve Material storage ensuring the 940 ARW meets deployment timelines. The proposed location for the Consolidated Storage Facility is west of Building 1023 near Lockheed Street and Doolittle Drive.

2.2 No Action Alternative

Demolish MOGAS Storage Tanks, 491-499. Under the No Action Alternative, MOGAS Storage Tanks 491 to 499 would not be demolished and would be abandoned in place. MOGAS fuel would be obtained from the new MOGAS station on the flightline. However, this alternative would not allow Bulk Fuels to use this space for future construction.

Construct Running Path at O'Malley Field. Under the No Action Alternative, no running track would be constructed and base personnel would have to utilize existing fitness areas. Medical physicians state that injuries from running should decrease as a result of the proposed path material. If the running path is not constructed, the potential for injuries could rise. Therefore, Beale AFB would not be able to reach its fitness goals potential and could adversely affect unit morale and retention.

Construct LOX Storage Facility. Under the No Action Alternative, the LOX facilities and infrastructure would remain in its current location and configuration. The LOX unloading and loading operations would still be located on the opposite end of the flightline from the main LOX users. LOX would have to be transported the entire length of the flightline. This alternative would cause the LOX missions users to

operate in an ineffective manner, which would delay mission requirements. In addition, transporting LOX across the entire length of the flightline could present safety problems.

Construct 940 ARW AGS Squadron Maintenance/Administration Facility. Under the No Action Alternative, 940 ARW/AGS management and administration personnel would continue to be housed in a modular facility distant from the rest of the squadron. This could impact the mission and efficiency of the 940 ARW.

Construct 940 SFS Mobility Equipment Storage Facility. Under the No Action Alternative, SFS equipment would continue to be stored in its current location and configuration. If equipment is stored in the uncovered compound, equipment would continue to be exposed to the elements and become unserviceable.

Construct Shoppette Gas Service Station and Car Wash. Under the No Action Alternative, the base would continue to operate its gasoline and food service in its current condition. No POVs car wash facility is located on base and food service locations are limited. The No Action Alternative would not provide adequate food services to base personnel and visitors and POV owners would continue to wash their vehicles off base.

Demolish NCO Club, Building 5800. Under the No Action Alternative, Building 5800 would not be demolished and would be abandoned in place. However, Building 5800 would continue to deteriorate and incur high maintenance and energy costs.

Construct 2-Bay Pre-flight Hangar. Under the No Action Alternative, all weather support requirements of the GH would be integrated into existing hangar requirements at Beale AFB. The new GH mission requirement would force many maintenance operations for both existing airframes and GH airframes to be done outside when it is recommended to be accomplished under cover. If no hangar is constructed, GH and other base mission requirements could be adversely hampered.

Construct 940 ARW Consolidated Storage Facility. Under the No Action Alternative, mission support equipment would continue to be stored in various locations throughout the base. In addition, the SR-71 hanger that contains more than 8,000 ft² of 940 ARW storage is slated for demolition in FY 2007 and there would be no alternate location for the equipment. The base also wants to eliminate all CONEX boxes on the installation.

The No Action Alternative would not address USAF mission and force protection concerns at Beale AFB. However, inclusion of the No Action Alternative is prescribed by the CEQ regulations and therefore, will be carried forward for further analysis in the EA.

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3. Affected Environment

Section 3.0 describes the environmental and socioeconomic resources and conditions most likely to be affected by the proposed construction projects. This section provides information to serve as a baseline from which to identify and evaluate environmental and socioeconomic changes likely to result from implementation of the Proposed Action. Baseline conditions represent current conditions. The potential environmental and socioeconomic impacts of the Proposed Action and No Action Alternative on the baseline conditions are described in Section 4.0.

In compliance with NEPA, CEQ guidelines, and 32 CFR Part 989, as amended, the description of the affected environment focuses on those resources and conditions potentially subject to impacts. Some environmental resources and conditions that are often analyzed in an EA have been omitted from this analysis. The following details the basis for such exclusions:

- **Cultural Resources.** All sites within 100 feet of each project boundary were evaluated for potential impacts using base cultural resource maps in the Cultural Resources Management Plan (BAFB 1998) and coordinating with the base Cultural Resources Manager. No cultural resources or artifacts were identified in the project areas of the Proposed Action. Therefore, there would be no impact to cultural resources at Beale AFB. Accordingly, USAF has omitted detailed examination of cultural resources. If an unexpected archaeological discovery occurs during construction, the unanticipated archeological discoveries procedures, as defined in the Beale AFB Cultural Resource Management Plan (BAFB 1998), would be followed. If archaeological properties are discovered, excavation and disturbance of the site would cease. The Cultural Resource Manager would be notified immediately. The Cultural Resource Manager would take actions to evaluate the discovery and provide guidance to the project engineer on any actions that should be taken to provide appropriate management treatment of the resource.
- **Land Use.** All activities associated with the Proposed Action would be consistent with present and foreseeable land use patterns at Beale AFB. Implementation of the Proposed Action would not significantly alter the existing land use at Beale AFB. Accordingly, the USAF has omitted detailed examination of land use.
- **Noise.** Implementation of the Proposed Action does not involve permanent alterations to aircraft inventories, operations, or missions. No new permanent ground-based heavy equipment operations are included in the Proposed Action. No activity included in the Proposed Action would result in a situation where residences would be impacted by an increase in present ambient

noise levels. Furthermore, noise produced by construction and demolition activities associated with the Proposed Action would not significantly affect sensitive receptors. The closest sensitive noise receptors are more than 0.5 miles from the project areas. Accordingly, USAF has omitted detailed examination of noise.

- ***Socioeconomics.*** The Proposed Action does not involve any activities that would directly affect off-base activities, or directly or indirectly contribute to changes in socioeconomic resources. There would be no change in the number of personnel assigned to Beale AFB and no changes in area population or associated changes in demand for housing and services. Accordingly, USAF has omitted detailed examination of socioeconomics in this EA.
- ***Environmental Justice.*** The Proposed Action does not involve any activities that would contribute to changes in low-income or minority populations because all work would be performed within the base boundary. Accordingly, USAF has omitted detailed examination of environmental justice.

3.1 Air Quality

Air quality in a given location is determined by the concentration of various pollutants in the atmosphere. National Ambient Air Quality Standards (NAAQS) are established by the U.S. Environmental Protection Agency (USEPA) for “criteria pollutants,” including ozone (O₃), carbon monoxide (CO), nitrogen dioxide (NO₂), sulfur dioxide (SO₂), particulate matter equal to or less than 10 microns in diameter (PM₁₀), particulate matter equal to or less than 2.5 microns in diameter (PM_{2.5}), and lead (Pb). NAAQS represent maximum levels of background pollution in the ambient air that are considered safe, with an adequate margin of safety to protect public health and welfare (see Table 3-1).

The California Environmental Protection Agency (Cal-EPA), California Air Resources Board (CARB) has delegated responsibility for implementation of the federal Clean Air Act (CAA) and California CAA to local air pollution control agencies. The Proposed Action is in the Feather River Air Quality Management District (FRAQMD) and is subject to rules and regulations developed by the FRAQMD.

The State of California adopted the NAAQS and promulgated additional State Ambient Air Quality Standards (SAAQS) for criteria pollutants. The California standards are more stringent than the federal primary standards. Table 3-1 presents the primary and secondary NAAQS and SAAQS that apply to air quality in California.

Table 3-1. National and California Ambient Air Quality Standards

Pollutant	Standard Value	Standard Type
Carbon Monoxide (CO)		
8-hour Average	9 ppm (10 mg/m ³)	National Primary and CA
1-hour Average	35 ppm (40 mg/m ³)	National Primary
1-hour Average	20 ppm (23 mg/m ³)	CA
Nitrogen Dioxide (NO₂)		
Annual Arithmetic Mean	0.053 ppm (100 µg/m ³)	National Primary and Secondary
1-hour Average	0.25 ppm (470 µg/m ³)	CA
Ozone (O₃)		
1-hour Average	0.12 ppm (235 µg/m ³)	National Primary and Secondary
8-hour Average	0.08 ppm (157 µg/m ³)	National Primary and Secondary
1-hour Average	0.09 ppm (180 µg/m ³)	CA
Lead (Pb)		
Quarterly Average	1.5 µg/m ³	National Primary and Secondary
Monthly Average	1.5 µg/m ³	CA
Particulate ≤ 10 microns (PM₁₀)		
Annual Arithmetic Mean	50 µg/m ³	National Primary and Secondary
24-hour Average	150 µg/m ³	National Primary and Secondary
Annual Arithmetic Mean	20 µg/m ³	CA
24-hour Average	50 µg/m ³	CA
Particulate ≤ 2.5 microns (PM_{2.5})		
Annual Arithmetic Mean	15 µg/m ³	National Primary and Secondary
Annual Arithmetic Mean	12 µg/m ³	CA Primary and Secondary
24-hour Average	65 µg/m ³	National and CA Primary and Secondary
Sulfur Dioxide (SO₂)		
Annual Arithmetic Mean	0.030 ppm (80 µg/m ³)	National Primary
24-hour Average	0.14 ppm (365 µg/m ³)	National Primary
3-hour Average	0.50 ppm (1300 µg/m ³)	National Secondary
1-hour Average	0.25 ppm (655 µg/m ³)	CA
24-hour Average	0.04 ppm (105 µg/m ³)	CA

CA – California

ppm - parts per million

mg/m³ - milligrams per cubic meter

µg/m³ - micrograms per cubic meter

NOTE: Concentration expressed first in units in which it was promulgated. Equivalent concentrations are given in parentheses for those standards promulgated in units of ppm.

Under the General Conformity Rule, the CAA prohibits federal agencies from performing projects that do not conform to a USEPA-approved State Implementation Plan (SIP). In 1993, USEPA developed final rules for how federal agencies must determine air quality conformity prior to implementing a proposed

federal action. Under these rules, certain actions are exempt from conformity determinations, while others are assumed to be in conformity if total project emissions are below *de minimis* levels established under 40 CFR 93.153. Total project emissions include both direct and indirect emissions caused by the federal action.

USEPA classifies the air quality in an air quality control region (AQCR) or in sub-areas of an AQCR according to whether the concentration of criteria pollutants in ambient air exceeds the primary or secondary NAAQS. All areas within each AQCR are therefore designated as either “attainment,” “non-attainment,” or “unclassified” for each of the six criteria pollutants. Attainment means that the air quality within an AQCR is better than the NAAQS, nonattainment indicates that air quality exceeds NAAQS, and an unclassifiable air quality designation by USEPA means that there is not enough information to appropriately classify an AQCR, so the area is considered attainment.

The General Conformity Rule requires that any federal action meet the requirements of a SIP or federal Implementation Plan (FIP). More specifically, CAA Conformity is assured when a federal action does not cause a new violation of the NAAQS, contribute to an increase in the frequency or severity of violations of NAAQS, or delay the timely attainment of any NAAQS, interim progress milestones, or other milestones toward achieving compliance with the NAAQS.

The conformity rule applies only to actions in nonattainment or maintenance areas and considers both direct and indirect emissions. The rule applies only to federal actions that are considered “regionally significant” or where the total emissions from the action meet or exceed the *de minimis* thresholds. An action is regionally significant when the total nonattainment pollutant emissions exceed 10 percent of the AQCR’s total emissions inventory for that nonattainment pollutant. If a federal action meets the *de minimis* threshold requirements and is not considered regionally significant, then a full Conformity Determination is not required.

Beale AFB is in Yuba County which is within the Sacramento Valley Intrastate AQCR. FRAQMD is responsible for implementing and enforcing state and federal air quality regulations in Yuba County, Sutter County, and portions of Northern Sacramento Valley Air Basin (NSVAB). The air quality in the FRAQMD has been characterized by USEPA as a *moderate* transitional nonattainment area for O₃ and unclassifiable/attainment for all other criteria pollutants.

3.2 Biological Resources

This section is an assessment of biological communities to include wildlife, vegetation, and wetland resources in the project areas. It is based on the following information:

- Integrated Natural Resources Management Plan (INRMP) for Beale AFB (BAFB 1999);
- Plant, wildlife, and wetland surveys conducted from January to July 2004;
- California Department of Fish and Game's California National Diversity Database (CNDDB); and
- Base wetland delineations.

The INRMP was developed to use as a tool in managing the natural resources found on the base. Most of the information below was obtained from the Beale AFB INRMP. Habitat communities on Beale AFB are shown in Figure 3-1.

This section describes the following aspects of the affected environment:

- Annual grasslands
- Special-Status Species

Annual Grasslands

Annual grassland is an upland plant community (habitat) dominated by nonnative grasses, but containing a diverse assemblage of native and nonnative forbs. Nonnative annual grasses and weedy annual and perennial forbs dominate this habitat type. Vegetation in the annual grassland is dominated by species that are rarely found in wetlands.

A majority of the Proposed Action occurs in annual grasslands. Most of the annual grasslands affected by the Proposed Action are previously disturbed and dominated by ruderal vegetation. The lower species diversity common in ruderal habitat generally provides less value to wildlife than the higher species diversity found in native annual grassland habitat. Scattered native wildflower species that represent remnants of the original vegetation are also present in less-disturbed sites.

Annual grasslands at Beale AFB provide foraging habitat and cover to numerous locally and regionally common wildlife species. The majority of annual grasslands that would be affected by the Proposed Action have been subject to disturbances from human activity. Wildlife values of these areas are

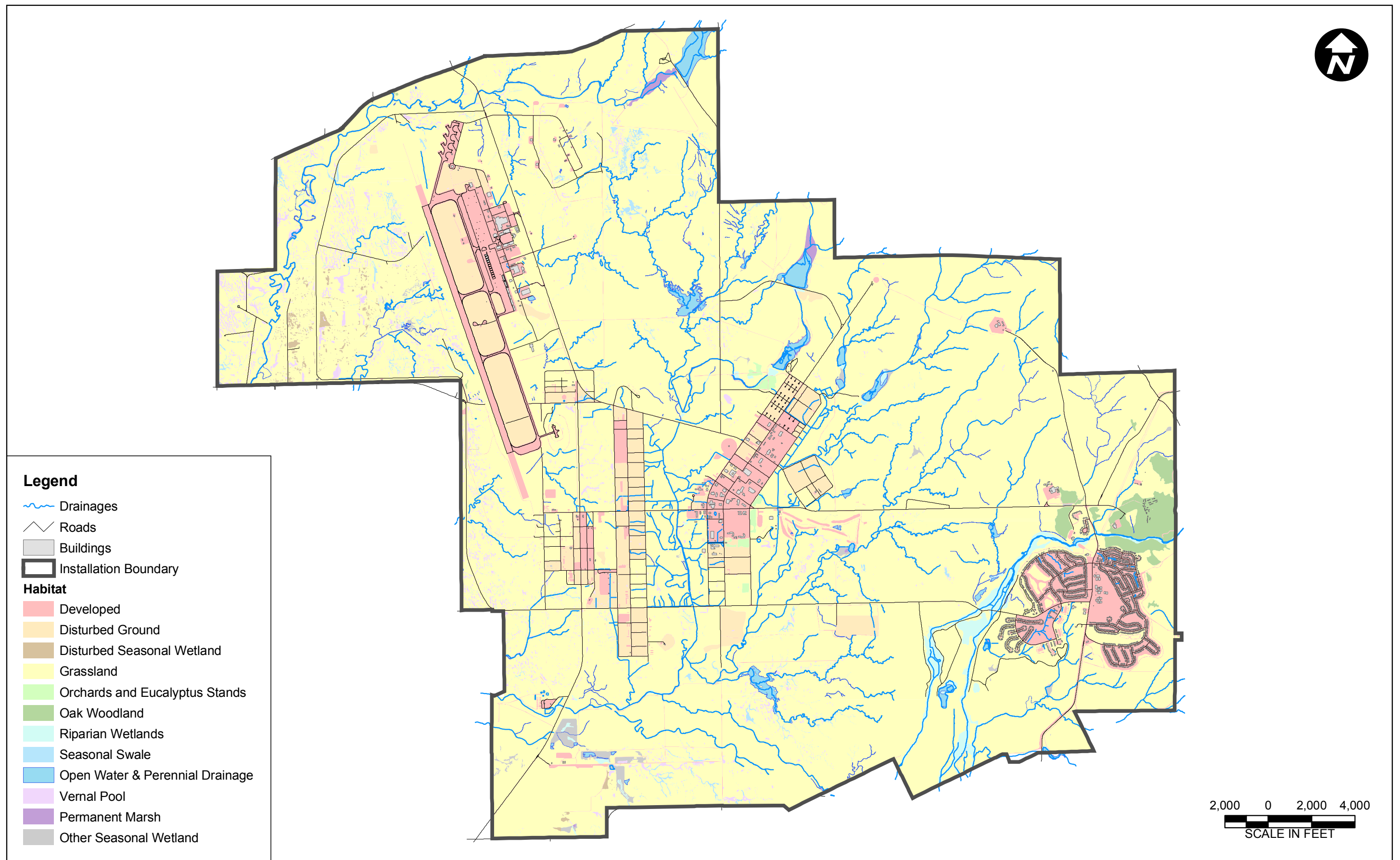


Figure 3-1. Habitat Types on Beale AFB

considered low. No vernal pool or wetlands occur in the project area. Therefore, wetlands will not be discussed further in the EA. No riparian areas occur in the project area. Therefore, riparian areas will not be discussed further in this EA.

Special-Status Species

Vegetation

There are four plant species formally protected under federal or state law: Hartweg's golden sunburst, Hairy Orcutt grass, Hoover's spurge, and Slender Orcutt grass. None of these four have been observed on Beale AFB. A fifth species – Greene's tuctoria – is proposed for federal listing, but has not been observed on Beale AFB.

Animals

There are thirteen animal species formally protected under federal or state law. Of those thirteen:

- The federally-protected vernal pool fairy shrimp and vernal pool tadpole shrimp habitat has not been observed on or adjacent to the project site.
- The federally- protected bald eagle is an irregular migrant to the area, and cannot be considered to be using the base for more than occasional foraging.
- The state-protected white-tailed kite – present on the base year-round – can not be considered to use the project site for more than occasional foraging.
- The state-protected golden eagle – a year-round visitor to the base – cannot be considered to use the project site for more than occasional foraging.
- The state-protected American peregrine falcon - an irregular visitor to the base – cannot be considered to use the project site for more than occasional foraging.
- The federally protected valley elderberry longhorn beetle has not been observed on or adjacent to the project site as there is no riparian habitat within the project boundaries.
- The federally protected giant garter snake habitat has not been observed on or adjacent to the project site as there are no drainages within the project boundaries.
- The state-protected black rail has not been observed on the project site.
- The state-protected Swainson's hawk and greater sandhill crane have not been observed on the project site.
- The federally protected Central Valley steelhead and Chinook salmon have not been observed on the project site as there are no waterways within the project boundaries.

- In addition, many bird species present on the project site (including those identified above) are subject to regulation under the Migratory Bird Treaty Act.

3.3 Geological Resources

An area's geological resources typically consist of surface and subsurface materials and their inherent properties. Soil depth, structure, elasticity, strength, shrink-swell potential, and erodibility determine a soil's ability to support man-made structures and facilities. Soils typically are described in terms of their series or association, slope, physical characteristics, and relative compatibility or constraints with respect to particular construction activities and types of land use.

The base is on the boundary between the Great Valley and Sierra Nevada Geologic Provinces and contains characteristics of both (BAFB 1999). A majority of Beale AFB has the geologic characteristics of river floodplains and channels of the Modesto Formation, low alluvial plains and fans of the riverbank formation, and dissected uplands of the Mehrten and Laguna Formations. The remainder of the base consists of metavolcanic rock characteristic of the Sierra Nevada foothills.

There are 10 soil series found on Beale AFB. These were grouped by the National Resources Conservation Service (NRCS) according to their topographic position and drainage characteristics. These soil types are Auburn loam, Argonaut-Auburn loams, Auburn-Sobrante loams, Auburn-Sobrante-rock outcrop complex, Conejo loam, Pardee gravelly loam, Pardee-Rancho Seco complex, Perkins loam, Redding-Corning complex, and San Joaquin loam (BAFB 2001). The LOX storage facility, 940 ARW AGS Squadron maintenance/administration facility, 940 SFS mobility storage facility, 2-bay pre-flight hangar, and 940 ARW consolidated storage facility projects are located in Redding-Corning complex. The demolish MOGAS Storage Tanks 491 to 499 project is located in San Joaquin loam. The running path at O'Malley Field project is located in San Joaquin loam, Perkins loam, and Redding-Corning complex. The demolish Building 5800 and construct shopette gas service station and car wash projects are located in Auburn-Sobrante loam.

3.4 Hazardous Materials and Wastes Management

Hazardous substances are defined by the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) as any substance with physical properties of ignitability, corrosivity, reactivity, or toxicity that can cause an increase in mortality, a serious irreversible illness, incapacitating reversible illness, or pose a substantial threat to human health or the environment. Hazardous waste is defined by the Resource Conservation and Recovery Act (RCRA) as any solid, liquid, contained gaseous, or

semisolid waste, or any combination of wastes that poses a substantial present or potential hazard to human health or the environment. DOD has also developed the ERP to facilitate thorough investigation and cleanup of contaminated sites on military installations. The ERP is designed to identify, confirm, and clean up problems arising from past releases of hazardous substances and petroleum products into the environment.

Hazardous Materials and Waste. 9th Civil Engineering Squadron/Environmental Flight (9 CES/CEV) is responsible for the hazardous material and waste plans for the installation. In conformance with the policies established by Air Force Policy Directive (AFPD) 32-70, 9 CES/CEV has developed plans to manage hazardous materials, hazardous wastes, and special hazards on the base. Base and contractor personnel collect hazardous wastes at initial accumulation points. From the initial accumulation points, wastes are taken to the Centralized Accumulation Site on the base and shipped to off-base disposal facilities. In accordance with the Beale AFB Hazardous Waste Management Program, hazardous wastes are stored on base for a maximum of 75 days.

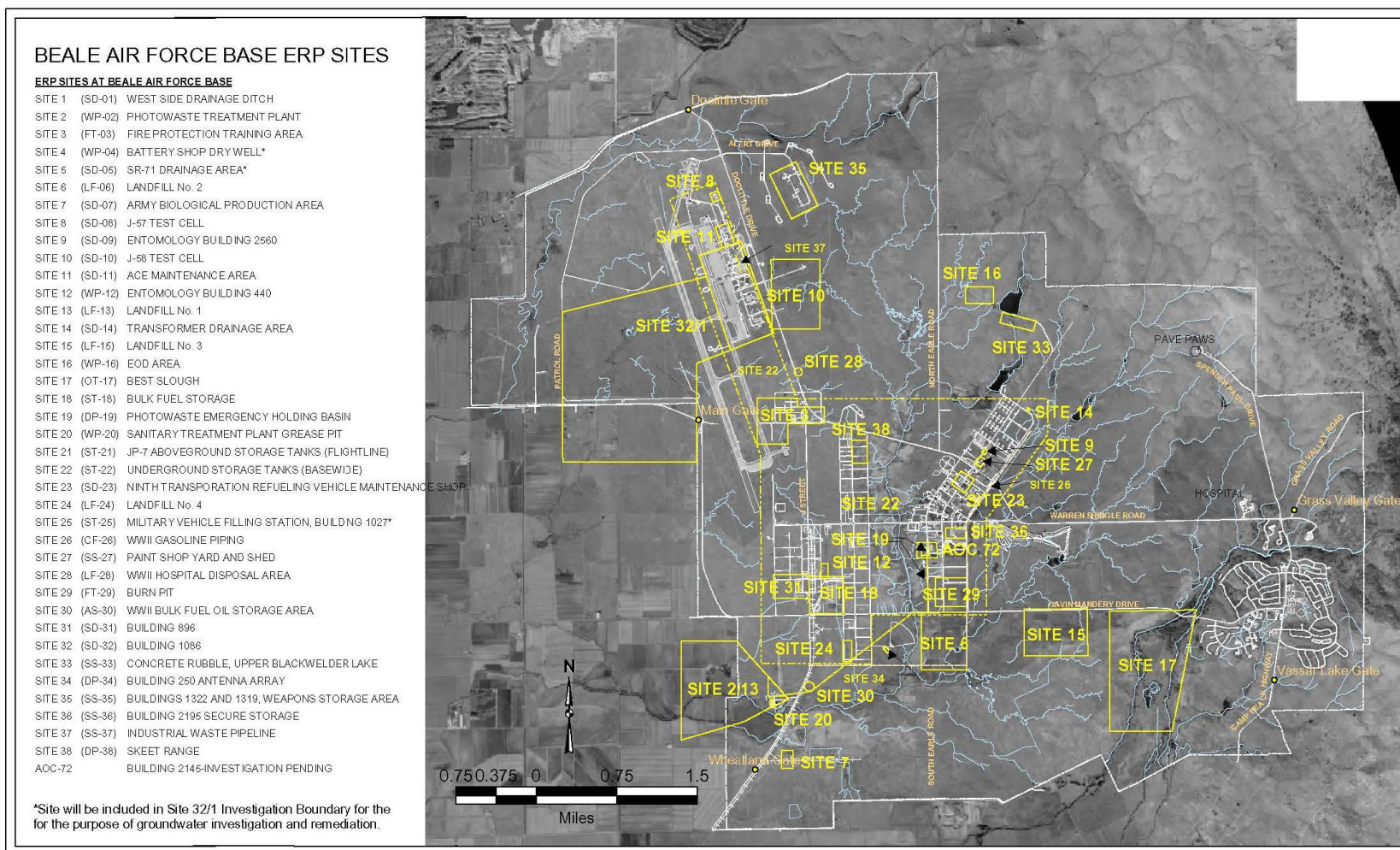
Asbestos-Containing Material (ACM). A survey was performed of buildings at Beale AFB to locate, identify, and evaluate any materials containing asbestos. Materials that might contain asbestos include thermal-system insulation and floor tiles. ACM is removed on an as-needed basis to minimize health risks from release of asbestos fibers during normal activities, maintenance, renovation, or demolition.

Lead-Based Paint (LBP). Beale AFB has conducted a survey of buildings for the presence of LBP. The survey mainly focused on child-occupied facilities. The results of the survey are maintained in an LBP database at Civil Engineering.

ERP. The ERP at Beale AFB began in 1984 with a base-wide records search that identified 16 ERP sites for further investigation (see Figure 3-2). Primary contaminants in soil and water include fuels, oils, pesticides, herbicides, waste solvents, and inorganic compounds. Progress under ERP is closely coordinated with various regulatory agencies, including the Cal-EPA Department of Toxic Substance Control (DTSC) and the California Regional Water Quality Control Board (CRWQCB).

Projects included in the Proposed Action are within or in close proximity to four ERP sites: SD-23, Ninth Transportation Refueling Vehicle Maintenance Shop; SD-32, Building 1086; ST-18, Bulk Fuel Storage Facility, and ST-22, Underground Storage Tanks (UST) (Basewide) (ACC 2003). These sites are described in more detail below.

Figure 3-2. Environmental Restoration Program Sites on Beale AFB



- **SD-23.** This site is part of the base's RCRA Part B permit. This site was used for fuel tanker truck maintenance in the 1940s and 1950s. Facilities at the site included a maintenance shop and an oil/water separator. Cleanup and abatement of this site requires periodic sampling of soil and groundwater via the use of base monitoring wells. Contaminants at this site include fuel hydrocarbons.
- **SD-32.** This site was used for B-52 equipment maintenance and associated with the Titan Missile Program. Historic operations associated with Building 1086 included the use of USTs, wash racks, oil/water separator, degreasing room, and industrial waste line. This site is a suspected source of halogenated volatile organic compounds (VOCs). Cleanup and abatement of this site requires periodic sampling of soil and groundwater via base monitoring and soil vapor extraction wells.
- **ST-18.** This site is part of the base's RCRA Part B permit. This site is used for bulk fuel storage and has been in operation since 1958. Fuels stored at this facility include aviation gasoline, jet fuels (JP-4, JP-8, JP-TS, and formerly JP-7), diesel fuel, mogas, unleaded gasoline, and No. 2 fuel oil. Contaminants at this site include fuel hydrocarbons. Cleanup and abatement of this site requires periodic sampling soil and groundwater via the use of base monitoring wells, bioventing pilot system, and soil vapor extraction system.
- **ST-22.** This site consists of USTs currently or formerly located at Beale AFB. This site is part of the base's RCRA Part B permit. This site contained approximately 1,089 fuel oil and gasoline USTs ranging in size from 150 to 12,000 gallons. Contaminated soil was identified and removed from this site. Soil vapor extraction and bioventing systems were installed within this site for treatment of residual petroleum hydrocarbons in the soil. Currently, a total of 66 USTs remain open and are scheduled for removal.

3.5 Safety

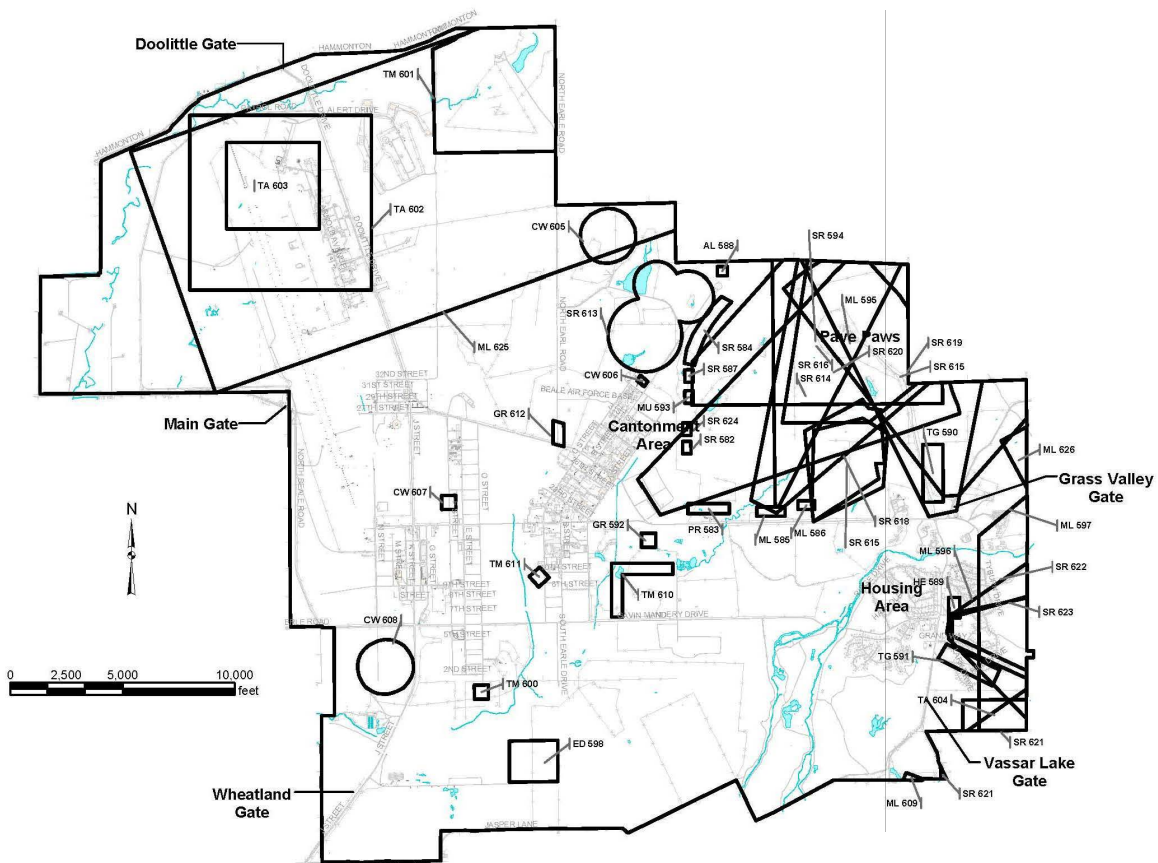
A safe environment is one in which the potential for death, serious bodily injury or illness, or property damage is eliminated or reduced as much as possible. Human health and safety addresses workers' health and safety during demolition and construction activities, and public safety during demolition and construction activities and subsequent operations of those facilities.

All contractors performing construction activities at Beale AFB are responsible for following ground safety regulations and worker compensation programs and are required to conduct construction activities

Figure 3-3. Active and Historic Ranges on Beale AFB

Ranges

- AL 588 – Anti-Aircraft Miniature Range (Range #6)
- CW 605 – Gas Area No. 1 (MRA 605)
- CW 606 – Gas Area No. 5 (MRA 606)
- CW 607 – Gas Area No. 18 (MRA 607)
- CW 608 – Gas Area No. 2 (MRA 608)
- ED 598 – Engineer Demolition Area
- GR 592 – Live Grenade Court (Range #15B)
- GR 612 – Grenade Area No. 15 (MRA 612)
- HE 589 – Anti-Tank Range (Range #8)
- ML 585 – 0.50 Cal Machine Gun Range (1,000 feet) (Range #4A)
- ML 586 – 0.50 Cal Machine Gun Range (1,000 feet) (Range #4B)
- ML 595 – 57 mm Rifle/60mm Mortar/0.50 Cal Machine Gun Range
- ML 596 – 0.30/0.50 Cal Transition Combat Range (Range #12)
- ML 597 – 0.30 Close Combat Range (Range #11)
- ML 609 – Mortar No. 13, 1943 (MRA 609)
- ML 625 – Primary Toss Bomb, 1956 (MRA 625)
- ML 626 – Proposed Toss Bomb, 1956 (MRA 626)
- MU 593 – Transition Firing Course (Range #20C)
- PR 583 – Pistol Range (Range #2)
- SR 582 – Known Distance Rifle Range
- SR 584 – 0.45 Cal Sub-Machine Gun Range (Range #3)
- SR 587 – 0.22 or 0.30 Cal Landscape Range (Range #5)
- SR 594 – 0.30 Cal Infiltration Range (Range #5)
- SR 613 – Range 1955 (MRA 613)
- SR 614 – Range No. 5, 1956 (MRA 614)
- SR 615 – Range No. 10, 1956 (MRA 615)
- SR 615 – Range No. 9, 1956 (MRA 615)
- SR 616 – Range, 1955 (MRA 616)
- SR 618 – Range, 1955 (MRA 618)
- SR 619 – Range, 1955 (MRA 619)
- SR 620 – Range No. 8, 1956 (MRA 620)
- SR 621 – Range No. 12, 1956 (MRA 621)
- SR 622 – Range No. 6, 1956 (MRA 622)
- SR 623 – Range, 1955 (MRA 623)
- SR 624 – Replica Fort No. 41, 1943
- TA 602 – Targets, 1955 (MRA 602)
- TA 603 – Target No. 5, 1956 (MRA 603)
- TA 604 – Targets, 1955 (MRA 604)
- TG 590 – Field Target (Range #11A)
- TG 591 – Field Target (Range #11B)
- TM 600 – Bayonet Range No. 1, 1943
- TM 601 – Bivouac Area (MRA 600)
- TM 610 – Obstacle Course No. 17A, 1943
- TM 611 – Obstacle Course No. 17, 1943



in a manner that does not pose any risk to workers or base personnel. An industrial hygiene program addresses exposure to hazardous materials, use of personal protective equipment, and availability of Material Safety Data Sheets. Industrial hygiene is a responsibility of contractors.

Beale AFB has several activities that require Explosive Quantity Distance (EQD) Safety Zones. These zones are established to minimize risk and exposure to individuals from explosives and explosive storage facilities. The General Plan shows numerous EQD Safety Zones on the northern and southern parts of the base (BAFB 2000).

The land encompassing Beale AFB was originally part of Camp Beale. Camp Beale was established in 1942 and consisted of approximately 62,000 acres in Yuba and Nevada Counties. Between 1942 and 1964, large portions of Camp Beale were leased, transferred, or sold to other parties. Between 1942 and 1964 the U.S. Army conducted various munitions tests throughout Camp Beale. Since 1964, the USAF has also conducted munitions tests on Beale AFB. In 2001, the USACE conducted an archives search report to determine the historic land uses, range locations, and types of munitions that might have been used on Camp Beale.

As part of this report it was discovered that Beale AFB has 44 range sites (see Figure 3-4). These range sites contain various munitions, unexploded ordnance (UXO), and Chemical Agent Identification Sets (CAIS). Most of the munitions, UXO, and CAIS on the surface of Camp Beale have been removed. However, munitions, UXO, and CAIS still can be found below the ground surface. Only the Demolish Building 5800 project is located within range sites. Although the other WINDO projects are not located within range sites, munitions, UXO, and CAIS may still be encountered within these project areas.

The need for munitions, UXO, and CAIS screening at potential UXO sites will be determined on a case by case basis. Any projects located within potential UXO sites would obtain an environmental restoration waiver from Headquarters (HQ) ACC/CEVR prior to commencement of construction activities. 9 CES/CEV staff would be contacted prior to commencement of construction activities to determine if an ERP waiver is required for the Proposed Action for all proposed work on or near range sites and for safety requirements that would need to be followed during construction.

3.6 Transportation

Regional access to Beale AFB is provided by State Route (SR) 65, SR 70, and SR 20. SR 65 is a north-south roadway extending from Interstate-80 in Roseville to SR 70 approximately 7 miles south of Marysville. Five main roads provide access to the base. North Beale Road extends from SR 70 in Linda

to the Main Gate and is the primary road connecting the installation and SR 70, Marysville, and Yuba City. Hammonton-Smartville Road is a two-lane rural roadway providing access from North Beale Road in Linda to SR 20 near Smartville. This roadway provides access to the base at the Doolittle Gate. Smartville Road is a two-lane rural roadway providing access from the Grass Valley Gate to Hammonton-Smartville Road south of SR 20. South Beale Road is a two-lane roadway providing access from SR 65 northwest of Wheatland to the Wheatland Gate. Spenceville Road is a two-lane rural roadway connecting SR 65 at the City of Wheatland to the Vassar Lake Gate. The road network on Beale AFB consists of arterials, collectors, and local streets. Arterials, those streets that carry the majority of the traffic, are

- Gavin Mandery Drive (Main Gate to Camp Beale Highway)
- Doolittle Drive (Doolittle Gate to Warren Shingle Road)
- Grass Valley Road/Warren Shingle Road (Grass Valley Gate to J Street)
- Camp Beale Highway (Vassar Lake Gate to Warren Shingle Road)
- J Street (Wheatland Gate to Doolittle Drive)

3.7 Water Resources

Water resources include surface water, groundwater, and floodplains. This evaluation identifies the quantity and quality of the resource and its demand for potable, irrigation, and industrial purposes. Surface water resources consist of lakes, rivers, and streams. Surface water is important for its contributions to the economic, ecological, recreational, and human health of a community or locale. Groundwater typically can be described in terms of its depth from the surface, aquifer or well capacity, water quality, surrounding geologic composition, and recharge rate. Floodplains are areas of low-level ground present along a river or stream channel. Federal, state, and local regulations often limit floodplain development to passive uses such as recreation and preservation activities to reduce the risks to human health and safety.

Surface Water. Several lakes and small impoundments are located on Beale AFB, and 3 major drainage channels (Dry, Hutchinson, and Reeds Creeks) cross the base in a generally northeast-to-southwest direction. Dry, Reeds, and Hutchinson Creeks are not located within the project area; however, many drainages are located within or adjacent to the project areas (Figure 3-4).

Groundwater. Yuba County is located over the north-central portion of the Central Valley groundwater basin, which is an extensive aquifer extending approximately 400 miles from Red Bluff to Bakersfield and averaging 40 miles wide. This aquifer is a complex system of different groundwater basins

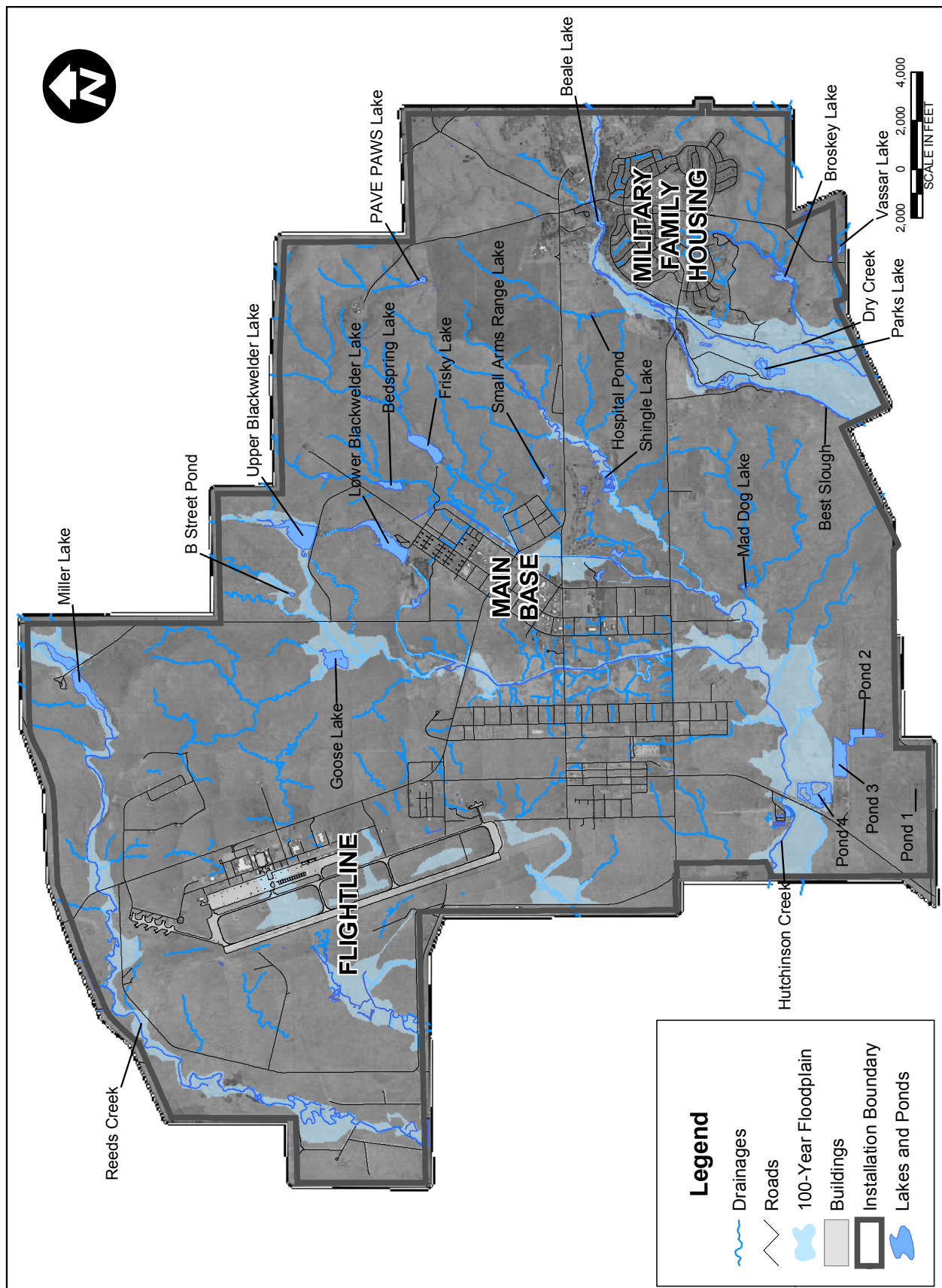


Figure 3-4. Major Surface Waters and 100-Year Floodplain on Beale AFB

composed of stratified sand, silt, and clay layers many thousands of feet thick. Groundwater at Beale AFB is found 300 to 500 feet below ground surface and is presumed to originate in unconfined aquifer materials with local clay/silt lenses overlying the aquifer. Groundwater in the northern portion of the base receives recharge from the Yuba River drainage basin and generally has the highest quality at the base, with low levels of total dissolved solids, nitrates, and sulfates; groundwater in the central portion of the base has higher levels of total dissolved solids; and groundwater at the south end of the base receives recharge from Dry Creek and the Bear River and has quality between that of the north and central regions.

Water for domestic use at Beale AFB is provided from 9 wells on the base that are 1 mile north of the main gate. Total water use at the base varies from 2.5 to 6.0 million gallons per day. The wells have a total combined pumping capacity of 5.0 million gallons per day. Water quality meets primary drinking standards, but not secondary water quality standards for iron and manganese, for which the only treatment is chlorination and fluoridation (BAFB 1999).

Floodplains. No floodplains are located within the project areas. Therefore, floodplains will not be discussed further in the EA.

4. Environmental Consequences

This section of the EA assesses direct and indirect effects on the environment associated with the scope of the Proposed Action as described in Section 2.0 and in consideration of the potentially affected environment as characterized in Section 3.0. Direct effects are caused by the action and occur at the same time and place. Indirect effects are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable.

4.1 Air Quality

The potential impacts on local and regional air quality conditions near a proposed federal action are determined based on the increases in regulated pollutant emissions relative to existing conditions and ambient air quality. Specifically, the impact in NAAQS attainment areas would be considered significant if the net increases in pollutant emissions from the Federal action resulted in one of the following scenarios:

- Cause or contribute to a violation of any national or state ambient air quality standard
- Expose sensitive receptors to substantially increased pollutant concentrations
- Represent an increase of 10 percent or more in an affected AQCR emissions inventory

Impacts on air quality in NAAQS nonattainment areas are considered significant if the net changes in project-related pollutant emissions result in one of the following scenarios:

- Cause or contribute to a violation of any national or state ambient air quality standard
- Increase the frequency or severity of a violation of any ambient air quality standard
- Exceed any significance criteria established in a SIP
- Delay the attainment of any standard or other milestone contained in the SIP

With respect to the General Conformity Rule, impacts on air quality would be considered significant if the proposed federal action would result in an increase of a nonattainment or maintenance area's emissions inventory by 10 percent or more for one or more nonattainment pollutants, or if such emissions exceed *de minimis* threshold levels established in 40 CFR 93.153(b) for individual nonattainment pollutants or for pollutants for which the area has been designated as a nonattainment or maintenance area.

Since a USEPA-designated nonattainment area would be affected by this Proposed Action, the USAF must comply with the federal General Conformity Rule (40 CFR Part 93). To do so, an analysis has been completed to ensure that, given the changes in direct and indirect emissions of the O₃ precursors (nitrogen oxides [NO_x] and VOCs), PM₁₀, and CO, the Proposed Action would be in conformity with applicable CAA requirements. The full Conformity Determination requirements specified in this rule can be avoided if the project-related nonattainment pollutant emissions rate increases are below *de minimis* threshold levels for each pollutant and are not considered regionally significant. For purposes of determining conformity in this nonattainment area, projected regulated pollutant emissions associated with the Proposed Action were estimated using available construction emissions and other nonpermitted emissions source information. The emissions calculations and *de minimis* threshold comparisons are collectively presented in the CAA General Conformity emissions calculations provided in Appendix B.

4.1.1 Proposed Action

Impacts on Air Quality. Construction projects would generate total suspended particulate (TSP) and PM₁₀ emissions as fugitive dust from ground-disturbing activities (e.g., grading, demolition, soil piles) and combustion of fuels in construction equipment. Fugitive dust emissions would be greatest during the initial site preparation activities and would vary from day to day depending on the construction phase, level of activity, and prevailing weather conditions. The quantity of uncontrolled fugitive dust emissions from a construction site is proportional to the area of land being worked and the level of construction activity.

Construction operations would also result in emissions of criteria pollutants as combustion products from construction equipment as well as evaporative emissions from architectural coatings and asphalt paving operations. These emissions would be of a temporary nature. The emissions factors and estimates were generated based on guidance provided in *Air Quality Thresholds of Significance* from the Sacramento Metropolitan Air Quality Management District (SMAQMD 1994).

For purposes of this analysis, information presented in Section 2 was used to estimate fugitive dust and all other criteria pollutant emissions. The construction emissions presented in Table 4-1 include the estimated annual construction PM₁₀ emissions associated with the Proposed Action at Beale AFB. These emissions would produce slightly elevated short-term PM₁₀ ambient air concentrations. However, the direct effects would be temporary and would fall off rapidly with distance from the proposed construction site.

Table 4-1. Annual Construction Emissions from the Proposed Action at Beale AFB, CA

Proposed Construction Emissions Estimates					
CY	NO_x¹ (tpy)	VOC¹ (tpy)	CO (tpy)	SO₂ (tpy)	PM₁₀ (tpy)
2005	11.40	4.45	6.43	0.66	40.90
2006	3.03	6.96	6.02	0.35	5.05
2007	19.02	6.44	17.15	0.93	7.11

Note:

¹ Denotes nonattainment pollutant in FRAQMD of the USEPA Region 9 Sacramento Valley Intrastate AQCR.

CY - Calendar Year

NO_x - Nitrogen Oxide(s)

VOC - Volatile Organic Compound

CO - Carbon Monoxide

SO₂ - Sulfur Dioxide

PM₁₀ - Particulate Matter ≤ 10 microns in diameter

tpy - tons per year

As mentioned earlier, FRAQMD is classified as being in *moderate* transitional nonattainment for O₃ and is in attainment for all other criteria pollutants. As shown in Table 4-1, the Proposed Action would generate emissions well below conformity *de minimis* limits as specified in 40 CFR 93.153 (note that even if all construction was to be conducted in one year, the total emissions would still be less than the *de minimis* limits). Because the emissions generated would be below *de minimis* levels, it is reasonable to assume that the temporary construction emissions caused by the Proposed Action would not cause a violation of the NAAQS and a full Conformity Determination would not be required. Therefore, no significant direct or indirect effects on regional or local air quality would result from implementation of the Proposed Action. Emissions factors, calculations, and estimates of construction-related emissions for the Proposed Action are detailed in Appendix B.

Environmental Protection Measures. No environmental protection measures required.

4.1.2 No Action Alternative

Under the No Action Alternative, there would be no change in or effects on air quality at Beale AFB.

4.2 Biological Resources

Determination of the significance of potential impact on biological resources is based on the importance (i.e., legal, commercial, recreational, ecological, or scientific) of the resource; the percentage of the resource that would be affected relative to its occurrence in the region; the sensitivity of the resource to proposed activities; and the duration of ecological ramifications. Impacts on biological resources are

significant if species or habitats of high concern are adversely affected over relatively large areas, or if disturbances cause reductions in population size or impact the distribution of a species of high concern.

4.2.1 Proposed Action

During the design phase of the Proposed Action, extensive efforts were made by Beale AFB to avoid and minimize potential construction-related disturbances (direct or indirect) on sensitive habitats and associated special-status plant and wildlife species. Botanical and biological surveys of the project areas were conducted in an effort to determine the placement of project features in relation to natural features, to avoid undue impacts on biological resources.

Impacts on Annual Grasslands. Implementation of the Proposed Action would result in a small loss of nonnative grassland habitat during construction. Due to the abundance of comparable grassland habitat in the surrounding area, the low loss of grassland habitat would not have an adverse impact on grasslands on Beale AFB.

Environmental Protection Measures. The project areas should be surveyed prior to and during construction to avoid undue impacts to biological resources.

4.2.2 No Action Alternative

Under the No Action Alternative, there would be no change in or effects on biological resources at Beale AFB.

4.3 Geological Resources

Protection of unique geological features, minimization of soil erosion, and the siting of facilities in relation to potential geologic hazards are considered when evaluating environmental consequences of a proposed action on geological resources. Generally, impacts can be avoided or minimized if proper construction techniques, erosion control measures, and structural engineering design are incorporated into project development.

4.3.1 Proposed Action

Impacts on Geological Resources. Under the Proposed Action, construction activities, such as grading, excavation, and recontouring of the soil, would result in direct effects on soil. Implementation of best management practices during construction would limit environmental consequences resulting from construction activities. Therefore, direct or indirect effects on soils, regional or local topography, or physiographic features at the base would not be significant from implementation of the Proposed Action.

Environmental Protection Measures. Fugitive dust from construction activities should be minimized by watering and soil stockpiling, thereby reducing to negligible levels the total amount of soil exposed. Standard erosion control means (silt fencing, sediment traps, application of water sprays, and revegetation at disturbed areas) would also reduce environmental consequences related to those characteristics.

4.3.2 No Action Alternative

Under the No Action Alternative, there would be no change in or effects on geological resources at Beale AFB.

4.4 Hazardous Materials and Wastes Management

Environmental consequences associated with hazardous material and waste would be significant if the storage, use, transportation, or disposal of these substances were to substantially increase the risk to human health or exposure to the environment. Impacts from ACM and LBP would be considered significant if Occupational Safety and Health Administration (OSHA) standards were exceeded. Impacts on the ERP would be considered significant if the federal action disturbed (or created) contaminated sites resulting in adverse effects on human health or the environment.

4.4.1 Proposed Action

Impacts on Hazardous Materials and Wastes. Construction activities associated with the Proposed Action would require the use of certain hazardous materials such as paints, welding gases, solvents, preservatives, and sealants. It is anticipated that the quantity of products containing hazardous materials used during the construction of the Proposed Action would be minimal and their use would be of short duration. The quantity of hazardous wastes generated from proposed construction activities would be negligible. Therefore, hazardous materials and wastes at Beale AFB would not be impacted by the proposed construction activities.

Impacts on ACM and LBP. Any ACM or LBP encountered during demolition of buildings would be handled in accordance with established USAF policy and the Asbestos Management Plan or Lead-Based Paint Management Plan. It is anticipated that the structures associated with the commercial vehicle inspection facility project contain ACM and LBPs. USAF regulations prohibit the use of ACM and LBPs for new construction. Specifications for new facilities would be in accordance with USAF policies and regulations.

Impacts on ERP. The Proposed Action is within or in close proximity to four ERP sites: SD-23, Ninth Transportation Refueling Vehicle Maintenance Shop; SD-32, Building 1086; ST-18, Bulk Fuel Storage Facility; and ST-22, USTs (Basewide) (ACC 2003).

The 940 SFS mobility storage facility project would be within ERP Site SD-23. This site is being treated and monitored for contaminants. Contaminants that may be encountered during construction include VOCs and fuel components.

The demolish MOGAS Storage Tanks 491 to 499 project is located in ERP Site ST-18. This site is being treated and monitored for contaminants. Contaminants that may be encountered during construction include VOCs and fuel components.

The 2-bay pre-flight hangar project is located in ERP Site SD-32. This site is being treated and monitored for contaminants. Contaminants that may be encountered during construction include VOCs and fuel components.

All projects except demolish Building 5800 are located in ERP Site ST-22. This site includes many UST sites, some of which are closed or will be prior to construction; and some which are undergoing treatment, monitoring, or investigation. Typical chemical hazards that may be encountered include fuels and fuel components in soils.

Environmental Protection Measures. Because of the potential for construction workers to be exposed to contamination from ERP sites during construction, it is recommended that a health and safety plan be prepared by the contractor in accordance with OSHA requirements prior to commencement of construction activities on ERP sites. Should contamination be encountered, handling, storage, transportation, and disposal activities would be conducted in accordance with applicable federal, state, and local regulations; AFIs; and Beale AFB programs and procedures. Workers at the ERP sites listed above should either have OSHA 40-hour Hazardous Waste Operations and Emergency Response (HAZWOPER) training, or a supervisor should have OSHA Site Supervisor certification. Current site-specific information about contamination, UST sites, and ERP infrastructure on and around each project should be obtained prior to construction and site-specific health and safety plans are prepared. Project planning should include protection of ERP infrastructure such as monitoring wells, treatment systems, conveyance pipe to avoid disruption of clean up activities.

4.4.2 No Action Alternative

Under the No Action Alternative, there would be no change in or effects on hazardous materials and wastes at Beale AFB.

4.5 Safety

If implementation of the Proposed Action were to substantially increase risks associated with the safety of Beale AFB personnel, contractors, or the local community, or substantially hinder the ability to respond to an emergency, it would represent a significant impact. Impacts were assessed based on the potential effects of construction and demolition activities.

4.5.1 Proposed Action

Impacts on Safety. Short-term, minor direct adverse effects would be expected from the Proposed Action. Implementation of the Proposed Action would slightly increase the short-term risk associated with construction contractors performing work at Beale AFB during the normal workday because the level of such activity would increase. Contractors would be required to establish and maintain safety programs. Projects associated with the Proposed Action would not pose a safety risk to base personnel or activities at the base. The proposed construction projects would enable 9 RW to meet future mission objectives at the base and conduct or meet mission requirements in a safe operating environment.

During construction activities associated with the Proposed Action, construction workers would have a medium possibility of encountering UXO or CAIS. The *Archives Search Report for Camp Beale Ordnance & Explosive Cleanup Project* (USACE 2001) contained only a partial listing of hazards at munitions response program range sites at Beale AFB. Preliminary assessments and site investigations have yet to be fully undertaken and the extent and character of contamination from UXO on Beale AFB is still being determined.

Environmental Protection Measures. An ERP waiver approved by HQ ACC is required prior to accomplishing any work on or near a range. 9 CES/CEV staff should be contacted prior to commencement of construction activities to determine if an ERP waiver is required for the Proposed Action for all proposed work on or near range sites and for safety requirements that would need to be followed during construction.

4.5.2 No Action Alternative

Under the No Action Alternative, there would be no change in or effects on construction worker safety.

4.6 Transportation

Impacts to transportation are considered to be adverse if the Proposed Action or alternatives would result in a substantial increase in traffic on local roadways, which is defined as more than 50 trips per hour. Project trip generation is based on an estimate of the number of equipment and crew members that would be present during construction activities.

4.6.1 Proposed Action

Impacts on Transportation. The construction and demolition phase of the Proposed Action would require delivery of materials to and removal of debris from construction sites. Construction traffic would comprise a small percentage of the total existing traffic and many of the vehicles would be driven to and kept onsite for the duration of construction and demolition, resulting in relatively few additional trips. Furthermore, potential increases in traffic volume associated with proposed construction activities would be temporary. Heavy vehicles are frequently on base roads. Therefore, the vehicles necessary for construction are not expected to have a heavy impact on base roads. All road and lane closures would be coordinated with the Security Forces and would be temporary in nature; therefore, no adverse direct or indirect effects on transportation systems would be expected.

Environmental Protection Measures. No environmental protection measures are required.

4.6.2 No Action Alternative

Under the No Action Alternative, there would be no change in or effects on traffic at Beale AFB.

4.7 Water Resources

Evaluation criteria for water resources impacts are based on water availability, quality, and use; existence of floodplains; and associated regulations. A potential impact on water resources would be significant if it were to reduce water availability to existing users or interfere with the supply, create or contribute to overdraft of groundwater basins, exceed safe annual yield of water supply sources, adversely affect water quality or endanger public health by creating or worsening adverse health hazard conditions, threaten or damage unique hydrologic characteristics, or violate established laws or regulations that have been adopted to protect or manage water resources of an area. The impact of flood hazards on a proposed action is significant if such an action is proposed in an area with a high probability of flooding.

4.7.1 Proposed Action

Impacts on Surface Waters. Implementation of the Proposed Action is expected to have no direct or indirect adverse effects on water quality. The Proposed Action would minimally increase the impervious surface area and runoff on the installation.

Impacts on Groundwater. None of the activities associated with the Proposed Action would affect groundwater quality.

Environmental Protection Measures. Adherence to best management practices and applicable codes and ordinances would reduce storm water runoff-related impacts to a level of insignificance. Erosion and sediment controls would be in place during construction to reduce and control siltation or erosion impacts on areas outside of the proposed construction sites.

4.7.2 No Action Alternative

Under the No Action Alternative, there would be no change in or effects on water resources at Beale AFB.

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5. Cumulative and Adverse Impacts

Cumulative impacts on environmental resources result from incremental effects of proposed actions, when combined with other past, present, and reasonably foreseeable future projects in the area. Cumulative impacts can result from individually minor, but collectively substantial, actions undertaken over a period of time by various agencies (federal, state, and local) or individuals. Informed decision making is served by consideration of cumulative impacts resulting from projects that are proposed, under construction, recently completed, or anticipated to be implemented in the reasonably foreseeable future.

During the timeframe of the Proposed Action, 9 RW may be constructing many of the projects listed in Appendix A. Table 5-1 summarizes potential cumulative effects on resources from the Proposed Action, when combined with other past, present, and future activities.

As seen in Table 5-1, no significant impacts on the environment would be anticipated from the Proposed Action in conjunction with these projects.

5.1 Unavoidable Adverse Impacts

Unavoidable adverse impacts would result from implementation of the Proposed Action. None of these impacts would be significant.

Biological Resources. The Proposed Action would result in minimal loss of vegetation and wildlife habitat. Because implementation of the Proposed Action would result in temporary or very minor effects on other resources on Beale AFB, the Proposed Action would not contribute to a substantial cumulative effect on other biological resources.

Energy. The use of nonrenewable resources is an unavoidable occurrence, although not considered significant. The Proposed Action would require the use of fossil fuels, a nonrenewable natural resource. Energy supplies, although relatively small, would be committed to the Proposed Action or No Action Alternative.

Geological Resources. Under the Proposed Action, construction activities, such as grading, excavating, and recontouring of the soil, would result in soil disturbance. Implementation of best management practices during construction would limit environmental consequences resulting from construction activities. Standard erosion control means would also reduce environmental consequences related to these characteristics. Although unavoidable, effects on soils at the base are not considered significant.

Table 5-1. Cumulative Effects on Resources

Resource	Past Actions	Current Background Activities	Proposed Action	Known Future Actions	Cumulative Effects
Air Quality	Moderate transitional non-attainment area for O ₃ .	Emissions from aircraft, vehicles, and stationary equipment.	Potential dust generation during soil removal, site grading, and construction.	Potential dust generation during soil removal, site grading, and construction.	Continued moderate transitional non-attainment area for O ₃ . Actions would be <i>de minimus</i> . Effect not significant.
Biological Resources	Degraded historic habitat of sensitive and common wildlife species.	Beale AFB operations and development impact wildlife habitat.	Minor disturbance of vegetation by construction.	Minor disturbance of vegetation by construction. Direct and indirect effects on threatened and endangered species.	Permanent loss of vegetation and low quality habitat. Direct and indirect effects on threatened and endangered species. Effect not significant.
Geological Resources	Past Beale AFB development has modified soils.	Beale AFB development modifies soils.	Grading, excavating, and recontouring of the soil would result in further soil disturbance.	Grading, excavating, and recontouring of the soil would result in further soil disturbance.	Impacts would be permanent but localized. Effect not significant.
Hazardous Materials and Wastes	Mission operations created hazardous materials and wastes. Identification and recordation of ERP sites and Areas of Concern (AOCs).	Mission operations create hazardous materials and wastes. Identification and recordation of ERP sites and AOCs.	Construction activities would generate small amounts of hazardous materials and wastes. Construction activities would be located within ERP sites.	Construction activities would generate small amounts of hazardous materials and wastes.	Small temporary increase in generation of hazardous materials and waste. Effect not significant.
Land Use	Previous Beale AFB development has modified land use.	Development at Beale AFB has modified land use.	Construction activities would result in further land use changes.	Further development at Beale AFB would result in land use changes.	Effects are permanent, but localized to the construction areas. Effect is not significant.
Safety	Portions of the base have been used as active ranges.	Identification and recordation of historic and active ranges.	Short-term effects on construction workers from construction activities and potential UXO.	Short-term effects on construction workers from construction activities and potential UXO.	Short-term effects on construction workers from construction activities and potential UXO. Effect not significant.
Transportation	Traffic infrastructure has been constructed on the base.	Traffic infrastructure currently has been constructed and maintained on the base.	Short-term effects on traffic circulation and road closures from construction activities.	Short-term effects on traffic circulation and road closures from construction activities.	Short-term effects on traffic circulation and road closures from construction activities. Effect not significant.
Water Resources	Surface water quality moderately impacted by development.	Surface water quality moderately impacted by development.	Potential sedimentation from construction activities and minor increase in percentage of impervious surface area.	Potential sedimentation from construction activities and minor increase in percentage of impervious surface area.	Increased impervious area would have negligible effects on storm water discharges and water quality. Effect not significant.

Hazardous Materials and Wastes. The generation of hazardous materials and wastes are unavoidable conditions associated with the Proposed Action. However, the potential generation of hazardous materials and wastes would not significantly increase over baseline conditions and, therefore, are not considered significant.

Land Use. The Proposed Action would result in converting 3.35 acres of open space to improved land use categories as well as disturb other areas already in improved lands. The construction and demolition projects are permanent and would impact only a minor amount of land on Beale AFB. While effects to land use are unavoidable with construction projects, the Proposed Action would not contribute to a substantial cumulative effect on land use resources.

5.2 Compatibility of the Proposed Action and Alternatives with the Objectives of Federal, Regional, State, and Local Land Use Plans, Policies, and Controls

Impacts on the ground surface as a result of the Proposed Action would occur entirely within the boundaries of Beale AFB. Construction activities would not result in any significant or incompatible land use changes on or off base. The proposed projects have been sited according to future land use zones. Consequently, construction activities would not be in conflict with future base land use policies or objectives. The Proposed Action would not conflict with any applicable off-base land use ordinances or designated clear zones.

5.3 Relationship Between Short-term Use and Long-term Productivity

Short-term uses of the biophysical components of man's environment include direct construction-related disturbances and direct impacts associated with an increase in population and activity that occurs over a period of less than 5 years. Long-term uses of man's environment include those impacts occurring over a period of more than 5 years, including permanent resource loss.

Several kinds of activities could result in short-term resource uses that compromise long-term productivity. Filling of wetlands or loss of other especially important habitats and consumptive use of high-quality water at nonrenewable rates are examples of actions that affect long-term productivity.

The Proposed Action would not result in an intensification of land use at Beale AFB and in the surrounding area. Development of the Proposed Action would not represent a significant loss of open space. Therefore, it is anticipated that the Proposed Action would not result in any cumulative land use or

aesthetic impacts. Long-term productivity of these sites would be increased by the development of the Proposed Action.

5.4 Irreversible and Irretrievable Commitments of Resources

The irreversible environmental changes that would result from implementation of the Proposed Action involve the consumption of material resources, energy resources, land, biological habitat, and human resources. The use of these resources is considered to be permanent.

Irreversible and irretrievable resource commitments are related to the use of nonrenewable resources and the effects that use of these resources will have on future generations. Irreversible effects primarily result from use or destruction of a specific resource that cannot be replaced within a reasonable time frame (e.g., energy and minerals).

Material Resources. Material resources utilized for the Proposed Action include building materials (for construction of facilities), concrete and asphalt (for roads), and various material supplies (for infrastructure). Most of the materials that would be consumed are not in short supply, would not limit other unrelated construction activities, and would not be considered significant.

Energy Resources. Energy resources utilized for the Proposed Action would be irretrievably lost. These include petroleum-based products (such as gasoline and diesel), natural gas, and electricity. During construction, gasoline and diesel would be used for the operation of construction vehicles. During operation, gasoline would be used for the operation of private and government-owned vehicles. Natural gas and electricity would be used by operational activities. Consumption of these energy resources would not place a significant demand on their availability in the region. Therefore, no significant effects would be expected.

Biological Resources. The Proposed Action would result in a minimal loss of vegetation and wildlife habitat on proposed construction sites. However, proposed construction is mostly occurring on already disturbed land.

Human Resources. The use of human resources for construction and operation is considered an irretrievable loss, only in that it would preclude such personnel from engaging in other work activities. However, the use of human resources for the Proposed Action represents employment opportunities and is considered beneficial.

6. List of Preparers

This EA has been prepared under the direction of Beale AFB. The individuals who contributed to the preparation of this document are listed below.

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Mr. Raul Reyes

B.A.A.S. Wildlife Biology

Years of Experience: 8 years

Ms. Gina von Damm Bogart

M.S. Geology

Years of Experience: 4

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Appendix A
WINDO Implementation Plan Project List

FY 2004 WINDO Projects

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Table A-1 lists the projects programmed for implementation on Beale AFB in FY 2004.

Table A-1. Projects Programmed for Fiscal Year 2004

Reference Number	Project Title	Action Category	Project Location	Funding Type	Approval Type/Title
1	Install Pop-Up Barriers, Vassar and Wheatland Gates ¹	Approved	Open Space	AT/FP	CATEX A2.3.12 EIAP #03.58
2	Construct Flightline Water Mains ¹	Approved	Airfield	ENV	Flightline and J Street Renovations EA EIAP #02.11
3	Repair Flightline Water Mains ¹	Approved	Airfield	ENV	Flightline and J Street Renovations EA EIAP #02.11
4	GH Dormitory (96 rooms) ¹	Approved	Housing	MILCON	Global Hawk EA
5	Building 1200/GH Mission Area Study ¹	Approved	Aircraft O&M	MILCON	CATEX A2.3.24 EIAP #03.46
6	Construct PSPTS Storage, RPRP OSS Office Space ¹	Approved	Aircraft O&M	SRMC	CATEX A.2.3.8 EIAP #03.96-98
7	Repair Taxiway F Shoulders ¹	Approved	Airfield	SRMC	CATEX A2.3.10 EIAP #04.13
8	Repair Parking for 940 CES/SVS CBT Facility ¹	Approved	Industrial	Tenants	CATEX A2.3.7 EIAP #04.15
9	Construct JP8 Truck Receipt Area at Offloading Headers ¹	Approved	Industrial	DESC	CATEX A.2.10 EIAP #04.66
10	SAM, Land Based Discharge System ¹	Approved	Water	ENV	CATEX A2.3.11 Ref EA from 1998 EIAP #04.25
11	Upgrade Dock 3 ¹	Approved	Aircraft O&M	GH	CATEX A.2.3.7 EIAP #04.07
12	Dog Kennel ¹	Approved	Multi-Use	GH	CATEX A2.3.11 Global Hawk EA EIAP #04.47
13	Allied Support for LRE-DGPS ¹	Approved	Open Space	GH	CATEX A2.3.11 Flightline Fire Station EA EIAP #04.11
14	All-weather surface on existing running track ¹	Approved	Outdoor Recreation Areas	QOL	CATEX A2.3.7 EIAP #04.30

Reference Number	Project Title	Action Category	Project Location	Funding Type	Approval Type/Title
15	Construct Reclaimed Water Landscape Irrigation System in Main Base ¹	Approved	Industrial	ENV	CATEX A2.3.12 EIAP #04.79
16	Repair Perimeter Fencing Grass Valley Gate ¹	Approved	Open Space	AT/FP	AT/FP Upgrades EA
17	Repair/Improve Main Gate ¹	Approved	Open Space	AT/FP	AT/FP Upgrades EA
18	Repair/Improve Wheatland Gate ¹	Approved	Open Space	AT/FP	AT/FP Upgrades EA
19	Repair Perimeter Fencing Doolittle Gate ¹	Approved	Open Space	AT/FP	AT/FP Upgrades EA
20	Repair Perimeter Fencing Wheatland Gate Phase 1 ¹	Approved	Open Space	AT/FP	AT/FP Upgrades EA
21	Repair Perimeter Fencing Wheatland Gate Phase 2 ¹	Approved	Open Space	AT/FP	AT/FP Upgrades EA
22	Repair Force Protection, PME Dorms ³	Proposed	Community	AT/FP	CATEX A2.3.10
23	Construct Force Protection, Contrails Dining Facility ³	Proposed	Community	AT/FP	CATEX A2.3.10
24	Construct Visitor Center Main Gate ⁵	Proposed	Open Space	AT/FP	WINDO EA Vol 2
25	Demolish MOGAS Storage Tanks 491-499 ⁴	Proposed	Industrial	DESC	WINDO EA Vol 1
26	Emergency Repair JPTS Filter Separators ³	Proposed	Industrial	DESC	CATEX A2.3.10
27	API 570 Inspection and Groundwater Testing on Bulk Storage UG ³	Proposed	Industrial	DESC	CATEX A2.3.10
28	Repair Bulk Storage Area JP8 PH ³	Proposed	Industrial	DESC	CATEX A2.3.10/12
29	2 New Valves on JP8 Pipeline ³	Proposed	Airfield	DESC	CATEX A2.3.10/12
30	API 653 JPTS Storage Tank Inspection ³	Proposed	Industrial	DESC	CATEX A2.3.10
31	Upgrade JP-8 Hydrant Outlets and Pit Lids ⁵	Proposed	Airfield and Open Space	DESC	WINDO EA Vol 2
32	Repair Land Based Discharge, Phase 1 ⁶	Concurrent	Water	ENV	This project will be evaluated under a separate EA EIAP #02.53

Reference Number	Project Title	Action Category	Project Location	Funding Type	Approval Type/Title
33	Construct Land Based Discharged, Groundwater Monitoring Wells ³	Proposed	Open Space	ENV	CATEX A2.3.26
34	GH Parking Prep 1- JP-7 Pipeline Closure ³	Proposed	Aircraft O&M	GH	CATEX A2.3.11 Global Hawk EA
35	GH Parking Prep 2 - Pavement Repair/Apron Tiedowns ³	Proposed	Aircraft O&M	GH	CATEX A2.3.11 Global Hawk EA
36	Fitness Center Lobby ³	Proposed	Community	QOL	CATEX A2.3.8
37	Construct Running Path at O'Malley Field ⁴	Proposed	Outdoor Recreation Areas	QOL	WINDO EA Vol 1
38	Landscape Valley Chapel ³	Proposed	Community	QOL	CATEX A2.3.10
39	Construct LOX Storage Facility ⁴	Proposed	Aircraft O&M and Industrial	O&M	WINDO EA Vol 1
40	Repair Airfield Taxiways and Aprons ³	Proposed	Airfield	GWOT	CATEX A2.3.10 EIAP #04.12
41	Heritage Park ⁵	Proposed	Open Space	QOL	WINDO EA Vol 2
42	Global Hawk LRE Cables ⁵	Proposed	Open Space	MILCON	WINDO EA Vol 2 EIAP #04.11

Source: 9 CES/CEC and 9 CES/CEV

Notes:

- ¹ Environmental approval for these projects was covered under previous environmental analysis; therefore, they will not be covered under this Environmental Assessment.
- ² Environmental analysis for these projects is currently ongoing; therefore, they will not be covered under this Environmental Assessment.
- ³ This project qualifies for an Air Force categorical exclusion.
- ⁴ This project is part of the Proposed Action and will be covered under this Environmental Assessment.
- ⁵ This project involves wetland and/or floodplain issues and will be covered in WINDO EA, Volume 2.
- ⁶ This project will be evaluated under a separate Environmental Assessment.

AAFES: Army & Air Force Exchange Service, AT/FP: Anti-Terrorism/Force Protection, CATEX: Categorical Exclusion, CBT: Computer Based Training, ENV: Environmental, O&M: Operations and Maintenance, FY: Fiscal Year, GH: Global Hawk, GWOT: Global War on Terrorism, LOX: Liquid Oxygen, MILCON: Military Construction, MOGAS: Motor Gasoline, QOL: Quality of Life, SRMC: Sustainment, Restoration, and Modernization for Contract, WINDO: Wing Infrastructure Development Outlook

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FY 2005 WINDO Projects

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Table A-2 lists the projects programmed for implementation on Beale AFB in FY 2005.

Table A-2. Projects Programmed for Fiscal Year 2005

Reference Number	Project Title	Action Category	Project Location	Funding Type	Approval Type/Title
43	Add/Alter Plaza at Youth Center, Building 3340 ¹	Approved	Community	AT/FP	CATEX A2.3.11 Youth Center EA
44	Repair J Street Water Mains, Phase 1 ¹	Approved	Multiple Land Uses	ENV	Flightline and J Street Renovations EA EIAP #02.18
45	Storm Water Soils Holding Area ¹	Approved	Open Space	ENV	CATEX A2.3.7
46	Add/Alter Bldg 1225 for Global Hawk Aerospace Ground Equipment ¹	Approved	Aircraft O&M	MILCON	CATEX A2.3.11 Global Hawk EA EIAP #02.41
47	Upgrade Dock 2, Building 1075 ¹	Approved	Aircraft O&M	GH	CATEX A2.3.8 EIAP #04.08
48	Construct Flightline Centralized Parking South ⁴	Proposed	Open Space	AT/FP	WINDO EA Vol 2
49	Construct Force Protection, 9 SFS ²	Proposed	Industrial	AT/FP	CATEX A2.3.10
50	Repair Force Protection, 9 CES DCC, Building 2539 ²	Proposed	Industrial	AT/FP	CATEX A2.3.10
51	Repair Dikes, 3 JP-8 Tanks ²	Proposed	Industrial	DESC	CATEX A2.3.10/12
52	Clean and Internally Coat JP-8 Pipeline ²	Proposed	Industrial	DESC	CATEX A2.3.10
53	Annual UST and Pipelines Tracer Integrity Testing ²	Proposed	Industrial	DESC	CATEX A2.3.10
54	Repair A St. Gas Station, Building 2499 ²	Proposed	Community	DESC	CATEX A2.3.10
55	Reroute Storm Water Bulk Fuels ²	Proposed	Industrial	ENV	CATEX A2.3.10 EIAP #03.03
56	Erosion Control at Miller Lake ⁴	Proposed	Water	ENV	WINDO EA Vol 2
57	Repair Lower Blackwelder Dam ²	Proposed	Water	ENV	CATEX A2.3.11 WINDO EA Vol 2
58	Erosion Control at Upper Blackwelder Lake ⁴	Proposed	Open Space	ENV	WINDO EA Vol 2
59	Fabrication Shop ²	Proposed	Industrial	GH	CATEX A2.3.11 Global Hawk EA

Reference Number	Project Title	Action Category	Project Location	Funding Type	Approval Type/Title
60	Add/Alter Weapons Vault in Building 1023 ²	Proposed	Aircraft O&M	GH	CATEX A2.3.8
61	Construct Joint 940 CES/SVS CBT Facility ²	Proposed	Industrial	O&M	CATEX A2.3.11
62	Construct 940 ARW AGS SQ Maintenance and Administration Facility ³	Proposed	Industrial	O&M	WINDO EA Vol 1
63	Construct 940 Security Force Squadron Mobility Equipment Storage Facility ³	Proposed	Open Space	O&M	WINDO EA Vol 1 EIAP #03.30
64	Construct Shopette Gas Service Station and Car Wash ³	Proposed	Open Space	AAFES	WINDO EA Vol 1
65	Construct 940 CES Entry Awning 940 CES Facility ²	Proposed	Industrial	Tenants	CATEX A2.3.8
66	P2 Rock Crusher ⁴	Proposed	Open Space	ENV	WINDO EA Vol. 2
67	Construct Gas Service Station, Auto Hobby Shop, and Car Wash ⁴	Proposed	Open Space	AAFES	WINDO EA Vol 2

Source: 9 CES/CEC and 9 CES/CEV

Notes:

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- ² This project qualifies for an Air Force categorical exclusion.
- ³ This project is part of the Proposed Action and will be covered under this Environmental Assessment.
- ⁴ This project involves wetland and/or floodplain issues and will be covered in WINDO EA, Volume 2.

AAFES: Army & Air Force Exchange Service, AT/FP: Anti-Terrorism/Force Protection, CATEX: Categorical Exclusion, CBT: Computer Based Training, ENV: Environmental, O&M: Operations and Maintenance, FY: Fiscal Year, GH: Global Hawk, GWOT: Global War on Terrorism, LOX: Liquid Oxygen, MILCON: Military Construction, MOGAS: Motor Gasoline, QOL: Quality of Life, SRMC: Sustainment, Restoration, and Modernization for Contract, WINDO: Wing Infrastructure Development Outlook

FY 2006 WINDO Projects

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Table A-3 lists the projects programmed for implementation on Beale AFB in FY 2006.

Table A-3. Projects Programmed for Fiscal Year 2006

Reference Number	Project Title	Action Category	Project Location	Funding Type	Approval Type/Title
68	Repair Water Mains J Street, Phase II ¹	Approved	Multiple Land Uses	ENV	Flightline and J Street Renovations EA
69	Child Development Center ¹	Approved	Industrial	MILCON	Global Hawk EA
70	Construct POL Office Building, Bulk Fuels Storage Area ³	Proposed	Industrial	GWOT	CATEX A2.3.10
71	Maintain Vassar Lake Gate House, Bldg. 3296 ²	Concurrent	Open Space	AT/FP	AT/FP Upgrades EA
72	Repair Force Protection Air Traffic Control Tower ³	Proposed	Aircraft O&M	AT/FP	CATEX A2.3.8
73	Repair Force Protection at AFCOMAC School ³	Proposed	Administrative	AT/FP	CATEX A2.3.10
74	Install Duress Alarms WG/CC & WG/CV Quarters ³	Proposed	Housing	AT/FP	CATEX A2.3.8
75	Repair Force Protection at Drinking Water Treatment Plant ³	Proposed	Open Space	AT/FP	CATEX A2.3.10
76	Construct Force Protection, Flightline Elevated H ₂ O Storage Tank ³	Proposed	Open Space	AT/FP	CATEX A2.3.11
77	Repair Force Protection, Recce Point Club ⁵	Proposed	Community	AT/FP	WINDO EA Vol 2
78	Construct Force Protection at Valley Chapel, Phase 2 ³	Proposed	Community	AT/FP	CATEX A2.3.10
79	Construct Dumpster Blast Mitigation, Main Base ³	Proposed	Multiple Land Uses	AT/FP	CATEX A2.3.10
80	Construct Dumpster Blast Mitigation, Flightline ³	Proposed	Aircraft O&M	AT/FP	CATEX A2.3.10

Reference Number	Project Title	Action Category	Project Location	Funding Type	Approval Type/Title
81	Demolish NAVAID Shop, Building 502 ³	Proposed	Industrial	O&M	CATEX A2.3.10
82	Demolish NCO Club, Building 5800 ⁴	Proposed	Community	O&M	WINDO EA Vol 1
83	Slurry JP-7 Test Cell Piping & JP4 Piping at Control Tower ³	Proposed	Airfield	DESC	CATEX A2.3.12
84	Demolish/Replace Security Lighting POL ³	Proposed	Industrial	DESC	CATEX A2.3.12
85	Washracks Storm Water Improvement ³	Proposed	Various	ENV	CATEX A2.3.8
86	Construct 2 Bay Pre-flight Hangar ⁴	Proposed	Aircraft O&M	MILCON	WINDO EA Vol 1
87	Construct 940 ARW Consolidated Storage Facility ⁴	Proposed	Open Space	O&M	WINDO EA Vol 1

Source: 9 CES/CEC and 9 CES/CEV

Notes:

- ¹ Environmental approval for these projects was covered under previous environmental analysis; therefore, they will not be covered under this Environmental Assessment.
- ² Environmental analysis for these projects is currently ongoing; therefore, they will not be covered under this Environmental Assessment.
- ³ This project qualifies for an Air Force categorical exclusion.
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Appendix B
Clean Air Act General Conformity Analysis Emissions Calculations

Emissions Estimates for EA of WINDO Implementation Plan Projects at Beale AFB, CA

This workbook contains

Summary	(this worksheet) Summarizes total emissions by calendar year.
Combustion	(one sheet for each calendar year) Estimates emissions from non-road equipment exhaust as well as painting.
Grading	(one sheet for each calendar year) Estimates the number of days of site preparation, to be used for estimating heavy equipment exhaust and earthmoving dust emissions)
Fugitive	(one sheet for each calendar year) Estimates fine particulate emissions from earthmoving, vehicle traffic, and windblown dust.

Summary of Construction Emissions

		NOx (ton)	VOC (ton)	CO (ton)	SO2 (ton)	PM10 (ton)
CY2005	Combustion	11.40	4.45	6.43	0.66	1.43
	Fugitive Dust					39.47
	TOTAL CY2005	11.40	4.45	6.43	0.66	40.90
		NOx (ton)	VOC (ton)	CO (ton)	SO2 (ton)	PM10 (ton)
CY2006	Combustion	3.03	6.96	6.02	0.35	0.58
	Fugitive Dust					4.47
	TOTAL CY2006	3.03	6.96	6.02	0.35	5.05
		NOx (ton)	VOC (ton)	CO (ton)	SO2 (ton)	PM10 (ton)
CY2007	Combustion	19.02	6.44	17.15	0.93	1.48
	Fugitive Dust					5.63
	TOTAL CY2007	19.02	6.44	17.15	0.93	7.11

General Conformity Regional Significance Thresholds (10% of regional budget)

Since future year budgets were not readily available, actual 1999 air emissions inventories for the counties were used as an approximation of the regional inventory. Because the Proposed Action is several orders of magnitude below significance, the conclusion would be the same, regardless of whether future year budget data set were used.

Sacramento Valley Intrastate AQCR

Year	Point and Area Sources Combined				
	NOx (tpy)	VOC (tpy)	CO (tpy)	SO2 (tpy)	PM10 (tpy)
1999	126,335	128,779	904,756	110,191	11,507

Source: USEPA-AirData NET Tier Report (<http://www.epa.gov/air/data/nettier.html>). Site visited on 2/20/04

Determination Significance (Significance Threshold = 10%)

	Point and Area Sources Combined				
	NOx (tpy)	VOC (tpy)	CO (tpy)	SO2 (tpy)	PM10 (tpy)
Minimum -1999	126,335	128,779	904,756	110,191	11,507
2005 Emissions	11.40	4.45	6.43	0.66	40.90
Proposed Action %	0.0090%	0.0035%	0.0007%	0.0006%	0.3555%

Determination Significance (Significance Threshold = 10%)

	Point and Area Sources Combined				
	NOx (tpy)	VOC (tpy)	CO (tpy)	SO2 (tpy)	PM10 (tpy)
Minimum -1999	126,335	128,779	904,756	110,191	11,507
2006 Emissions	3.03	6.96	6.02	0.35	5.05
Proposed Action %	0.0024%	0.0054%	0.0007%	0.0003%	0.0439%

Determination Significance (Significance Threshold = 10%)

	Point and Area Sources Combined				
	NOx (tpy)	VOC (tpy)	CO (tpy)	SO2 (tpy)	PM10 (tpy)
Minimum -1999	126,335	128,779	904,756	110,191	11,507
2007 Emissions	19.02	6.44	17.15	0.93	7.11
Proposed Action %	0.0151%	0.0050%	0.0019%	0.0008%	0.0618%

WINDO Implementation Plan Projects at Beale AFB, CA

Construction Combustion Emissions

Includes:

1 100% of Construct LOX Storage Facility	10,365 ft2	0.24 acres
2 100% of Construct Running Path at O'Malley Field	1,363,055 ft2	31.29 acres
3 100% of Demolish MOGAS Storage Tanks, 491-499	17,122 ft2	0.39 acres

Note: The above projects are FY04 funded projects. It is assumed that these projects will be completed sometime in CY05.

Construction Site Air Emissions

Combustion Emissions of ROG, NOx, SO2, CO and PM10 Due to Construction

User Inputs:

Total Building Area:	27,487 ft ²	(1 and 3)
Total Paved Area:	1,363,055 ft ²	(2)
Total Disturbed Area:	31.92 acres	(1-3)
Construction Duration:	1.0 years	(assumed)
Annual Construction Activity:	230 days/yr	(assumed)

Results:[Average per Year Over the Construction Period]

	VOC	NOx	SO2	CO	PM10
Emissions, lbs/day	38.71	99.10	5.70	55.88	12.46
Emissions, tons/yr	4.45	11.40	0.66	6.43	1.43

Calculation of Unmitigated Emissions

Summary of Input Parameters

	VOC	NOx	SO2	CO	PM10
Total new acres disturbed:	31.92	31.92	31.92	31.92	31.92
Total new acres paved:	31.29	31.29	31.29	31.29	31.29
Total new building space, ft ² :	27,487	27,487	27,487	27,487	27,487
Total years:	1.00	1.00	1.00	1.00	1.00
Area graded, acres in 1 yr:	31.92	31.92	31.92	31.92	31.92
Area paved, acres in 1 yr:	31.29	31.29	31.29	31.29	31.29
Building space, ft ² in 1 yr:	27,487	27,487	27,487	27,487	27,487

Annual Emissions by Source (lbs/day)

	VOC	NOx	SO2	CO	PM10
Grading Equipment	8.0	51.1	3.4	11.1	8.9
Asphalt Paving	8.2	0.0	0.0	0.0	0.0
Stationary Equipment	4.6	3.8	0.3	0.8	0.2
Mobile Equipment	4.4	44.3	2.1	44.0	3.3
Architectural Coatings (Non-Res)	13.5	0.0	0.0	0.0	0.0
Total Emissions (lbs/day):	38.7	99.1	5.7	55.9	12.5

Emission Factors

Reference: Air Quality Thresholds of Significance, SMAQMD, 1994.

Source	SMAQMD Emission Factor				
	VOC	NOx	SO2 *	CO *	PM10
Grading Equipment	2.50E-01 lbs/acre/day	1.60E+00 lbs/acre/day	0.11 lbs/acre/day	0.35 lbs/acre/day	2.80E-01 lbs/acre/day
Asphalt Paving	2.62E-01 lbs/acre/day	NA	NA	NA	NA
Stationary Equipment	1.68E-04 lbs/day/ft ²	1.37E-04 lbs/day/ft ²	9.11E-06 lbs/day/ft ²	2.97E-05 lbs/day/ft ²	8.00E-06 lbs/day/ft ²
Mobile Equipment	1.60E-04 lbs/day/ft ²	1.61E-03 lbs/day/ft ²	7.48E-05 lbs/day/ft ²	0.0016 lbs/day/ft ²	1.20E-04 lbs/day/ft ²
Architectural Coatings (Non-Res)	8.15E-02 lbs/day/ft	NA	NA	NA	NA

* Factors for grading equipment and stationary equipment are calculated from AP-42 for diesel engines using ratios with the NOx factors.
Factors for mobile equipment are calculated from ratios with Mobile5a 2001 NOx emission factors for heavy duty trucks for each site.

WINDO Implementation Plan Projects at Beale AFB, CA

Construction Fugitive Dust Emissions

Calculation of PM10 Emissions Due to Site Preparation (Uncontrolled).

User Input Parameters / Assumptions

Acres graded per year:	31.92	acres/yr	(From "Combustion" worksheet)
Grading days/yr:	27.34	days/yr	(From "Grading" worksheet)
Exposed days/yr:	90	assumed days/yr	graded area is exposed
Grading Hours/day:	8	hr/day	
Soil piles area fraction:	0.10	(assumed fraction of site area covered by soil piles)	
Soil percent silt, s:	8.5	%	(mean silt content; expected range: 0.5 to 23, AP-42 Table 13.2.2-1)
Soil percent moisture, M:	50	%	(NOAA 2003 http://www.cpc.noaa.gov/products/soilmst/drought_composite.html#CSMRP)
Annual rainfall days, p:	60	days/yr	rainfall exceeds 0.01 inch/day (AP-42 Fig 13.2.2-1)
Wind speed > 12 mph %, I:	21.5	%	Ave. wind speed at Yuba City, CA (http://www.epa.gov/ttn/naaqs/ozone/areas/wind.htm)
Fraction of TSP, J:	0.5	(SCAQMD recommendation)	
Mean vehicle speed, S:	5	mi/hr	(On-site)
Dozer path width:	8	ft	
Qty construction vehicles:	3.83	vehicles	(From "Grading" worksheet)
On-site VMT/vehicle/day:	5	mi/veh/day	(Excluding bulldozer VMT during grading)
PM10 Adjustment Factor k	2.6	lb/VMT	(AP-42 Table 13.2.2-2 9/98 for PM10)
PM10 Adjustment Factor a	0.8	(dimensionless)	(AP-42 Table 13.2.2-2 9/98 for PM10)
PM10 Adjustment Factor b	0.4	(dimensionless)	(AP-42 Table 13.2.2-2 9/98 for PM10)
PM10 Adjustment Factor c	0.3	(dimensionless)	(AP-42 Table 13.2.2-2 9/98 for PM10)
Mean Vehicle Weight W	40	tons	assumed for aggregate trucks

Emissions Due to Soil Disturbance Activities

Operation Parameters (Calculated from User Inputs)

Grading duration per acre	6.9 hr/acre	
Bulldozer mileage per acre	1 VMT/acre	(Miles traveled by bulldozer during grading)
Construction VMT per day	19 VMT/day	
Construction VMT per acre	16.4 VMT/acre	(Travel on unpaved surfaces within site)

Equations Used (Corrected for PM10)

Operation	Empirical Equation	Units	AP-42 Section (5th Edition)
Bulldozing	$0.75(s^{1.5})/(M^{1.4})$	lbs/hr	Table 11.9-18.24, Overburden
Grading	$(0.60)(0.051)s^{2.0}$	lbs/VMT	Table 11.9-18.24
Vehicle Traffic	$[k(s/12)^a (W/3)^b/(M/0.2)^c] [(365-P)/365]$	lbs/VMT	Section 13.2.2

Source: Compilation of Air Pollutant Emission Factors, Vol. I, USEPA AP-42, Section 11.9 dated 7/98 and Section 13.2 dated 9/98

Calculation of PM10 Emission Factors for Each Operation

Operation	Emission Factor (mass/ unit)	Operation Parameter	Emission Factor (lbs/ acre)
Bulldozing	0.08 lbs/hr	6.9 hr/acre	0.6 lbs/acre
Grading	0.77 lbs/VMT	1 VMT/acre	0.8 lbs/acre
Vehicle Traffic	0.89 lbs/VMT	16.4 VMT/acre	14.5 lbs/acre

Emissions Due to Wind Erosion of Soil Piles and Exposed Graded Surface

Reference: Air Quality Thresholds of Significance, SCAQMD, 1994.

Soil Piles EF = $1.7(s/1.5)[(365 - H)/235](I/15)(J) = (s)(365 - H)(I)(J)/(3110.2941)$, p. A9-99.

Soil Piles EF = 9 lbs/day/acre covered by soil piles

Consider soil piles area fraction so that EF applies to graded area

Soil piles area fraction: 0.10 (Fraction of site area covered by soil piles)

Soil Piles EF = 0.9 lbs/day/acres graded

Graded Surface EF = 26.4 lbs/day/acre (recommended in CEQA Manual, p. A9-93).

Calculation of Annual PM10 Emissions

Source	Emission Factor	Graded Acres/yr	Exposed days/yr	Emissions lbs/yr	Emissions tons/yr
Bulldozing	0.6 lbs/acre	31.92	NA	19	0.01
Grading	0.8 lbs/acre	31.92	NA	26	0.01
Vehicle Traffic	14.5 lbs/acre	31.92	NA	463	0.23
Erosion of Soil Piles	0.9 lbs/acre/day	31.92	90	2,586	1.29
Erosion of Graded Surface	26.4 lbs/acre/day	31.92	90	75,848	37.92
TOTAL				78,941	39.47

Soil Disturbance EF: 15.9 lbs/acre

Wind Erosion EF: 27.3 lbs/acre/day

Back calculate to get EF: 90.5 lbs/acre/grading day

WINDO Implementation Plan Projects at Beale AFB, CA

Construction (Grading) Schedule

Estimate of time required to grade a specified area.

Input Parameters

Construction area 31.92 acres/yr (from "Combustion" Worksheet)
 Qty Equipment: 3.83 (calculated based on acres disturbed, assuming that up to three machines can effectively work on a 25 acre area, with a minimum of three machines for any job, regardless of area graded)

Assumptions.

Terrain is mostly flat.

An average of 6" soil is excavated from one half of the site and backfilled to the other half of the site; no soil is hauled off-site or borrowed.

200 hp bulldozers are used for site clearing.

300 hp bulldozers are used for stripping, excavation, and backfill.

Vibratory drum rollers are used for compacting.

Stripping, Excavation, Backfill and Compaction require an average of two passes each.

Excavation and Backfill are assumed to involve only half of the site.

Calculation of days required for one piece of equipment to grade the specified area.

Reference: Means Heavy Construction Cost Data, 6th Ed., R. S. Means, 1992.

Means Line No.	Operation	Description	Output	Units	Acres per equip-day)	equip-days per acre	Acres/yr	Equip-days per year
021 108 0550	Site Clearing	Dozer & rake, medium brush	0.6	acre/day	0.6	1.67	31.92	53.20
021 144 0300	Stripping	Topsoil & stockpiling, adverse soil	1,650	cu. yd/day	2.05	0.49	31.92	15.61
022 242 5220	Excavation	Bulk, open site, common earth, 150' haul	800	cu. yd/day	0.99	1.01	15.96	16.09
022 208 5220	Backfill	Structural, common earth, 150' haul	1,950	cu. yd/day	2.42	0.41	15.96	6.60
022 226 5020	Compaction	Vibrating roller, 6 " lifts, 3 passes	1,950	cu. yd/day	2.42	0.41	31.92	13.21
TOTAL								104.71

Calculation of days required for the indicated pieces of equipment to grade the designated acreage.

(Equip)(day)/yr: 104.71

Qty Equipment: 3.83

Grading days/yr: 27.34

Round to	27 grading days/yr
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WINDO Implementation Plan Projects at Beale AFB, CA

Construction Combustion Emissions

Includes:

1 100% of Construct 940 ARW AGS Squadron Maintenance/Administration Facility	5,156 ft2	0.12 acres
2 100% of Construct 940 SFS Mobility Equipment Storage Facility	16,629 ft2	0.38 acres
3 100% of Construct Shoppette Gas Service Station	8,652 ft2	0.20 acres
4 100% of Construct Shoppette Gas Service Station Pavements	125,888 ft2	2.89 acres
5 100% of Construct Car Wash	900 ft2	0.02 acres

Note: The above projects are FY05 funded projects. It is assumed that these projects will be completed sometime in CY06.

Construction Site Air Emissions

Combustion Emissions of ROG, NOx, SO2, CO and PM10 Due to Construction

Assumed 12 foot wide construction disturbance for perimeter fence

User Inputs:

Total Building Area:	31,337 ft ²	(1-4)
Total Paved Area:	125,888 ft ²	(5)
Total Disturbed Area:	3.61 acres	(1-5)
Construction Duration:	1.0 years	(assumed)
Annual Construction Activity:	230 days/yr	(assumed)

Results:[Average per Year Over the Construction Period]

	VOC	NOx	SO2	CO	PM10
Emissions, lbs/day	26.37	60.52	3.01	52.35	5.02
Emissions, tons/yr	3.03	6.96	0.35	6.02	0.58

Calculation of Unmitigated Emissions

Summary of Input Parameters

	VOC	NOx	SO2	CO	PM10
Total new acres disturbed:	3.61	3.61	3.61	3.61	3.61
Total new acres paved:	2.89	2.89	2.89	2.89	2.89
Total new building space, ft ² :	31,337	31,337	31,337	31,337	31,337
Total years:	1.00	1.00	1.00	1.00	1.00
Area graded, acres in 1 yr:	3.61	3.61	3.61	3.61	3.61
Area paved, acres in 1 yr:	2.89	2.89	2.89	2.89	2.89
Building space, ft ² in 1 yr:	31,337	31,337	31,337	31,337	31,337

Annual Emissions by Source (lbs/day)

	VOC	NOx	SO2	CO	PM10
Grading Equipment	0.9	5.8	0.4	1.2	1.0
Asphalt Paving	0.8	0.0	0.0	0.0	0.0
Stationary Equipment	5.3	4.3	0.3	0.9	0.3
Mobile Equipment	5.0	50.5	2.3	50.2	3.8
Architectural Coatings (Non-Res)	14.4	0.0	0.0	0.0	0.0
Total Emissions (lbs/day):	26.4	60.5	3.0	52.3	5.0

Emission Factors

Reference: Air Quality Thresholds of Significance, SMAQMD, 1994.

Source	SMAQMD Emission Factor				
	VOC	NOx	SO2 *	CO *	PM10
Grading Equipment	2.50E-01 lbs/acre/day	1.60E+00 lbs/acre/day	0.11 lbs/acre/day	0.35 lbs/acre/day	2.80E-01 lbs/acre/day
Asphalt Paving	2.62E-01 lbs/acre/day	NA	NA	NA	NA
Stationary Equipment	1.68E-04 lbs/day/ft ²	1.37E-04 lbs/day/ft ²	9.11E-06 lbs/day/ft ²	2.97E-05 lbs/day/ft ²	8.00E-06 lbs/day/ft ²
Mobile Equipment	1.60E-04 lbs/day/ft ²	1.61E-03 lbs/day/ft ²	7.48E-05 lbs/day/ft ²	0.0016 lbs/day/ft ²	1.20E-04 lbs/day/ft ²
Architectural Coatings (Non-Res)	8.15E-02 lbs/day/ft	NA	NA	NA	NA

* Factors for grading equipment and stationary equipment are calculated from AP-42 for diesel engines using ratios with the NOx factors.
Factors for mobile equipment are calculated from ratios with Mobile5a 2001 NOx emission factors for heavy duty trucks for each site.

WINDO Implementation Plan Projects at Beale AFB, CA

Construction Fugitive Dust Emissions

Calculation of PM10 Emissions Due to Site Preparation (Uncontrolled).

User Input Parameters / Assumptions

Acres graded per year:	3.61 acres/yr	(From "Combustion" worksheet)
Grading days/yr:	3.95 days/yr	(From "Grading" worksheet)
Exposed days/yr:	90	assumed days/yr graded area is exposed
Grading Hours/day:	8 hr/day	
Soil piles area fraction:	0.10	(assumed fraction of site area covered by soil piles)
Soil percent silt, s:	8.5 %	(mean silt content; expected range: 0.5 to 23, AP-42 Table 13.2.2-1)
Soil percent moisture, M:	50 %	(NOAA 2003 http://www.cpc.noaa.gov/products/soilmst/drought_composite.html#CSMRP)
Annual rainfall days, p:	60 days/yr	rainfall exceeds 0.01 inch/day (AP-42 Fig 13.2.2-1)
Wind speed > 12 mph %, I:	21.5 %	Ave. wind speed at Yuba City, CA (http://www.epa.gov/ttn/naaqs/ozone/areas/wind.htm)
Fraction of TSP, J:	0.5	(SCAQMD recommendation)
Mean vehicle speed, S:	5 mi/hr	(On-site)
Dozer path width:	8 ft	
Qty construction vehicles:	3.83 vehicles	(From "Grading" worksheet)
On-site VMT/vehicle/day:	5 mi/veh/day	(Excluding bulldozer VMT during grading)
PM10 Adjustment Factor k	2.6 lb/VMT	(AP-42 Table 13.2.2-2 9/98 for PM10)
PM10 Adjustment Factor a	0.8 (dimensionless)	(AP-42 Table 13.2.2-2 9/98 for PM10)
PM10 Adjustment Factor b	0.4 (dimensionless)	(AP-42 Table 13.2.2-2 9/98 for PM10)
PM10 Adjustment Factor c	0.3 (dimensionless)	(AP-42 Table 13.2.2-2 9/98 for PM10)
Mean Vehicle Weight W	40 tons	assumed for aggregate trucks

Emissions Due to Soil Disturbance Activities

Operation Parameters (Calculated from User Inputs)

Grading duration per acre	8.7 hr/acre	
Bulldozer mileage per acre	1 VMT/acre	(Miles traveled by bulldozer during grading)
Construction VMT per day	19 VMT/day	
Construction VMT per acre	20.9 VMT/acre	(Travel on unpaved surfaces within site)

Equations Used (Corrected for PM10)

Operation	Empirical Equation	Units	AP-42 Section (5th Edition)
Bulldozing	$0.75(s^{1.5})/(M^{1.4})$	lbs/hr	Table 11.9-18.24, Overburden
Grading	$(0.60)(0.051)s^{2.0}$	lbs/VMT	Table 11.9-18.24
Vehicle Traffic	$[k(s/12)^a (W/3)^b / (M/0.2)^c] [(365-P)/365]$	lbs/VMT	Section 13.2.2

Source: Compilation of Air Pollutant Emission Factors, Vol. I, USEPA AP-42, Section 11.9 dated 7/98 and Section 13.2 dated 9/98

Calculation of PM10 Emission Factors for Each Operation

Operation	Emission Factor (mass/ unit)	Operation Parameter	Emission Factor (lbs/ acre)
Bulldozing	0.08 lbs/hr	8.7 hr/acre	0.7 lbs/acre
Grading	0.77 lbs/VMT	1 VMT/acre	0.8 lbs/acre
Vehicle Traffic	0.89 lbs/VMT	20.9 VMT/acre	18.5 lbs/acre

Emissions Due to Wind Erosion of Soil Piles and Exposed Graded Surface

Reference: Air Quality Thresholds of Significance, SCAQMD, 1994.

Soil Piles EF = $1.7(s/1.5)[(365 - H)/(235)(I/15)(J) = (s)(365 - H)(I)(J)/(3110.2941)]$, p. A9-99.

Soil Piles EF = 9 lbs/day/acre covered by soil piles

Consider soil piles area fraction so that EF applies to graded area

Soil piles area fraction: 0.10 (Fraction of site area covered by soil piles)

Soil Piles EF = 0.9 lbs/day/acres graded

Graded Surface EF = 26.4 lbs/day/acre (recommended in CEQA Manual, p. A9-93).

Calculation of Annual PM10 Emissions

Source	Emission Factor	Graded Acres/yr	Exposed days/yr	Emissions lbs/yr	Emissions tons/yr
Bulldozing	0.7 lbs/acre	3.61	NA	3	0.00
Grading	0.8 lbs/acre	3.61	NA	3	0.00
Vehicle Traffic	18.5 lbs/acre	3.61	NA	67	0.03
Erosion of Soil Piles	0.9 lbs/acre/day	3.61	90	292	0.15
Erosion of Graded Surface	26.4 lbs/acre/day	3.61	90	8,576	4.29
TOTAL				8,940	4.47

Soil Disturbance EF: 20 lbs/acre

Wind Erosion EF: 27.3 lbs/acre/day

Back calculate to get EF: 627.6 lbs/acre/grading day

WINDO Implementation Plan Projects at Beale AFB, CA

Construction (Grading) Schedule

Estimate of time required to grade a specified area.

Input Parameters

Construction area: 3.61 acres/yr (from "Combustion" Worksheet)
 Qty Equipment: 3.00 (calculated based on acres disturbed, assuming that up to three machines can effectively work on a 25 acre area, with a minimum of three machines for any job, regardless of area graded)

Assumptions.

Terrain is mostly flat.

An average of 6" soil is excavated from one half of the site and backfilled to the other half of the site; no soil is hauled off-site or borrowed.

200 hp bulldozers are used for site clearing.

300 hp bulldozers are used for stripping, excavation, and backfill.

Vibratory drum rollers are used for compacting.

Stripping, Excavation, Backfill and Compaction require an average of two passes each.

Excavation and Backfill are assumed to involve only half of the site.

Calculation of days required for one piece of equipment to grade the specified area.

Reference: Means Heavy Construction Cost Data, 6th Ed., R. S. Means, 1992.

Means Line No.	Operation	Description	Output	Units	Acres per equip-day)	equip-days per acre	Acres/yr	Equip-days per year
021 108 0550	Site Clearing	Dozer & rake, medium brush	0.6	acre/day	0.6	1.67	3.61	6.02
021 144 0300	Stripping	Topsoil & stockpiling, adverse soil	1,650	cu. yd/day	2.05	0.49	3.61	1.76
022 242 5220	Excavation	Bulk, open site, common earth, 150' haul	800	cu. yd/day	0.99	1.01	1.80	1.82
022 208 5220	Backfill	Structural, common earth, 150' haul	1,950	cu. yd/day	2.42	0.41	1.80	0.75
022 226 5020	Compaction	Vibrating roller, 6 " lifts, 3 passes	1,950	cu. yd/day	2.42	0.41	3.61	1.49
TOTAL								11.84

Calculation of days required for the indicated pieces of equipment to grade the designated acreage.

(Equip)(day)/yr: 11.84

Qty Equipment: 3.00

Grading days/yr: 3.95

Round to	4 grading days/yr
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WINDO Implementation Plan Projects at Beale AFB, CA

Construction Combustion Emissions

Includes:

1 100% of Demolish NCO, Building 5800	44,848 ft ²	1.03 acres
2 100% of Construct 2 Bay Pre-flight Hangar	21,988 ft ²	0.50 acres
3 100% of Construct Aircraft Parking Apron	107,639 ft ²	2.47 acres
4 100% of Construct 940 ARW Consolidated Support Facility	23,672 ft ²	0.54 acres

Note: The above projects are FY06 funded projects. It is assumed that these projects will be completed sometime in CY07.

Construction Site Air Emissions

Combustion Emissions of ROG, NOx, SO₂, CO and PM₁₀ Due to Construction

Assumed 12 foot wide construction disturbance for perimeter fence

User Inputs:

Total Building Area:	90,508 ft ²	(1, 2, & 4)
Total Paved Area:	107,639 ft ²	(3)
Total Disturbed Area:	4.55 acres	(1-4)
Construction Duration:	1.0 years	(assumed)
Annual Construction Activity:	230 days/yr	(assumed)

Results:[Average per Year Over the Construction Period]

	VOC	NOx	SO ₂	CO	PM ₁₀
Emissions, lbs/day	55.99	165.40	8.08	149.16	12.86
Emissions, tons/yr	6.44	19.02	0.93	17.15	1.48

Calculation of Unmitigated Emissions

Summary of Input Parameters

	VOC	NOx	SO2	CO	PM10
Total new acres disturbed:	4.55	4.55	4.55	4.55	4.55
Total new acres paved:	2.47	2.47	2.47	2.47	2.47
Total new building space, ft ² :	90,508	90,508	90,508	90,508	90,508
Total years:	1.00	1.00	1.00	1.00	1.00
Area graded, acres in 1 yr:	4.55	4.55	4.55	4.55	4.55
Area paved, acres in 1 yr:	2.47	2.47	2.47	2.47	2.47
Building space, ft ² in 1 yr:	90,508	90,508	90,508	90,508	90,508

Annual Emissions by Source (lbs/day)

	VOC	NOx	SO2	CO	PM10
Grading Equipment	1.1	7.3	0.5	1.6	1.3
Asphalt Paving	0.6	0.0	0.0	0.0	0.0
Stationary Equipment	15.2	12.4	0.8	2.7	0.7
Mobile Equipment	14.5	145.7	6.8	144.9	10.9
Architectural Coatings (Non-Res)	24.5	0.0	0.0	0.0	0.0
Total Emissions (lbs/day):	56.0	165.4	8.1	149.2	12.9

Emission Factors

Reference: Air Quality Thresholds of Significance, SMAQMD, 1994.

Source	SMAQMD Emission Factor				
	VOC	NOx	SO2 *	CO *	PM10
Grading Equipment	2.50E-01 lbs/acre/day	1.60E+00 lbs/acre/day	0.11 lbs/acre/day	0.35 lbs/acre/day	2.80E-01 lbs/acre/day
Asphalt Paving	2.62E-01 lbs/acre/day	NA	NA	NA	NA
Stationary Equipment	1.68E-04 lbs/day/ft ²	1.37E-04 lbs/day/ft ²	9.11E-06 lbs/day/ft ²	2.97E-05 lbs/day/ft ²	8.00E-06 lbs/day/ft ²
Mobile Equipment	1.60E-04 lbs/day/ft ²	1.61E-03 lbs/day/ft ²	7.48E-05 lbs/day/ft ²	0.0016 lbs/day/ft ²	1.20E-04 lbs/day/ft ²
Architectural Coatings (Non-Res)	8.15E-02 lbs/day/ft	NA	NA	NA	NA

* Factors for grading equipment and stationary equipment are calculated from AP-42 for diesel engines using ratios with the NOx factors.
Factors for mobile equipment are calculated from ratios with Mobile5a 2001 NOx emission factors for heavy duty trucks for each site.

WINDO Implementation Plan Projects at Beale AFB, CA

Construction Fugitive Dust Emissions

Calculation of PM10 Emissions Due to Site Preparation (Uncontrolled).

User Input Parameters / Assumptions

Acres graded per year:	4.55 acres/yr	(From "Combustion" worksheet)
Grading days/yr:	4.97 days/yr	(From "Grading" worksheet)
Exposed days/yr:	90	assumed days/yr graded area is exposed
Grading Hours/day:	8 hr/day	
Soil piles area fraction:	0.10	(assumed fraction of site area covered by soil piles)
Soil percent silt, s:	8.5 %	(mean silt content; expected range: 0.5 to 23, AP-42 Table 13.2.2-1)
Soil percent moisture, M:	50 %	(NOAA 2003 http://www.cpc.noaa.gov/products/soilmst/drought_composite.html#CSMRP)
Annual rainfall days, p:	60 days/yr	rainfall exceeds 0.01 inch/day (AP-42 Fig 13.2.2-1)
Wind speed > 12 mph %, I:	21.5 %	Ave. wind speed at Yuba City, CA (http://www.epa.gov/ttn/naaqs/ozone/areas/wind.htm)
Fraction of TSP, J:	0.5	(SCAQMD recommendation)
Mean vehicle speed, S:	5 mi/hr	(On-site)
Dozer path width:	8 ft	
Qty construction vehicles:	3.83 vehicles	(From "Grading" worksheet)
On-site VMT/vehicle/day:	5 mi/veh/day	(Excluding bulldozer VMT during grading)
PM10 Adjustment Factor k	2.6 lb/VMT	(AP-42 Table 13.2.2-2 9/98 for PM10)
PM10 Adjustment Factor a	0.8 (dimensionless)	(AP-42 Table 13.2.2-2 9/98 for PM10)
PM10 Adjustment Factor b	0.4 (dimensionless)	(AP-42 Table 13.2.2-2 9/98 for PM10)
PM10 Adjustment Factor c	0.3 (dimensionless)	(AP-42 Table 13.2.2-2 9/98 for PM10)
Mean Vehicle Weight W	40 tons	assumed for aggregate trucks

Emissions Due to Soil Disturbance Activities

Operation Parameters (Calculated from User Inputs)

Grading duration per acre	8.7 hr/acre	
Bulldozer mileage per acre	1 VMT/acre	(Miles traveled by bulldozer during grading)
Construction VMT per day	19 VMT/day	
Construction VMT per acre	20.9 VMT/acre	(Travel on unpaved surfaces within site)

Equations Used (Corrected for PM10)

Operation	Empirical Equation	Units	AP-42 Section (5th Edition)
Bulldozing	$0.75(s^{1.5})/(M^{1.4})$	lbs/hr	Table 11.9-18.24, Overburden
Grading	$(0.60)(0.051)s^{2.0}$	lbs/VMT	Table 11.9-18.24
Vehicle Traffic	$[k(s/12)^a (W/3)^b / (M/0.2)^c] [(365-P)/365]$	lbs/VMT	Section 13.2.2

Source: Compilation of Air Pollutant Emission Factors, Vol. I, USEPA AP-42, Section 11.9 dated 7/98 and Section 13.2 dated 9/98

Calculation of PM10 Emission Factors for Each Operation

Operation	Emission Factor (mass/ unit)	Operation Parameter	Emission Factor (lbs/ acre)
Bulldozing	0.08 lbs/hr	8.7 hr/acre	0.7 lbs/acre
Grading	0.77 lbs/VMT	1 VMT/acre	0.8 lbs/acre
Vehicle Traffic	0.89 lbs/VMT	20.9 VMT/acre	18.5 lbs/acre

Emissions Due to Wind Erosion of Soil Piles and Exposed Graded Surface

Reference: Air Quality Thresholds of Significance, SCAQMD, 1994.

Soil Piles EF = $1.7(s/1.5)[(365 - H)/(235)(I/15)(J) = (s)(365 - H)(I)(J)/(3110.2941)]$, p. A9-99.

Soil Piles EF = 9 lbs/day/acre covered by soil piles

Consider soil piles area fraction so that EF applies to graded area

Soil piles area fraction: 0.10 (Fraction of site area covered by soil piles)

Soil Piles EF = 0.9 lbs/day/acres graded

Graded Surface EF = 26.4 lbs/day/acre (recommended in CEQA Manual, p. A9-93).

Calculation of Annual PM10 Emissions

Source	Emission Factor	Graded Acres/yr	Exposed days/yr	Emissions lbs/yr	Emissions tons/yr
Bulldozing	0.7 lbs/acre	4.55	NA	3	0.00
Grading	0.8 lbs/acre	4.55	NA	4	0.00
Vehicle Traffic	18.5 lbs/acre	4.55	NA	84	0.04
Erosion of Soil Piles	0.9 lbs/acre/day	4.55	90	368	0.18
Erosion of Graded Surface	26.4 lbs/acre/day	4.55	90	10,808	5.40
TOTAL				11,267	5.63

Soil Disturbance EF: 20 lbs/acre

Wind Erosion EF: 27.3 lbs/acre/day

Back calculate to get EF: 498.0 lbs/acre/grading day

WINDO Implementation Plan Projects at Beale AFB, CA

Construction (Grading) Schedule

Estimate of time required to grade a specified area.

Input Parameters

Construction area: 4.55 acres/yr (from "Combustion" Worksheet)
 Qty Equipment: 3.00 (calculated based on acres disturbed, assuming that up to three machines can effectively work on a 25 acre area, with a minimum of three machines for any job, regardless of area graded)

Assumptions.

Terrain is mostly flat.

An average of 6" soil is excavated from one half of the site and backfilled to the other half of the site; no soil is hauled off-site or borrowed.

200 hp bulldozers are used for site clearing.

300 hp bulldozers are used for stripping, excavation, and backfill.

Vibratory drum rollers are used for compacting.

Stripping, Excavation, Backfill and Compaction require an average of two passes each.

Excavation and Backfill are assumed to involve only half of the site.

Calculation of days required for one piece of equipment to grade the specified area.

Reference: Means Heavy Construction Cost Data, 6th Ed., R. S. Means, 1992.

Means Line No.	Operation	Description	Output	Units	Acres per equip-day)	equip-days per acre	Acres/yr	Equip-days per year
021 108 0550	Site Clearing	Dozer & rake, medium brush	0.6	acre/day	0.6	1.67	4.55	7.58
021 144 0300	Stripping	Topsoil & stockpiling, adverse soil	1,650	cu. yd/day	2.05	0.49	4.55	2.22
022 242 5220	Excavation	Bulk, open site, common earth, 150' haul	800	cu. yd/day	0.99	1.01	2.27	2.29
022 208 5220	Backfill	Structural, common earth, 150' haul	1,950	cu. yd/day	2.42	0.41	2.27	0.94
022 226 5020	Compaction	Vibrating roller, 6 " lifts, 3 passes	1,950	cu. yd/day	2.42	0.41	4.55	1.88
TOTAL								14.92

Calculation of days required for the indicated pieces of equipment to grade the designated acreage.

(Equip)(day)/yr: 14.92

Qty Equipment: 3.00

Grading days/yr: 4.97

Round to	5 grading days/yr
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SACRAMENTO VALLEY INTRASTATE AQCF

STATE	COUNTY	NOx (tpy)		VOC (tpy)		CO (tpy)	
		AREA SOURCE EMISSIONS	POINT SOURCE EMISSIONS	AREA SOURCE EMISSIONS	POINT SOURCE EMISSIONS	AREA SOURCE EMISSIONS	POINT SOURCE EMISSIONS
CA	Butte Co	10,172	329	13,710	204	92,603	944
CA	Colusa Co	3,165	872	3,434	245	27,650	261
CA	Glenn Co	3,410	506	3,952	190	28,267	1,042
CA	Sacramento Co	47,378	360	46,038	613	357,608	432
CA	Shasta Co	11,015	2,708	13,880	318	115,836	6,935
CA	Solano Co	17,128	3,914	20,746	1,591	115,310	1,734
CA	Sutter Co	5,176	800	6,321	47	42,272	226
CA	Tehama Co	4,483	223	4,057	47	32,166	452
CA	Yolo Co	9,833	808	8,480	292	49,159	699
CA	Yuba Co	3,687	368	4,566	48	31,032	128
		115,447	10,888	125,184	3,595	891,903	12,853

STATE	COUNTY	SO2 (tpy)		PM10 (tpy)	
		AREA SOURCE EMISSIONS	POINT SOURCE EMISSIONS	AREA SOURCE EMISSIONS	POINT SOURCE EMISSIONS
CA	Butte Co	486	2	11,830	394
CA	Colusa Co	140	11	8,485	403
CA	Glenn Co	212	35	6,871	525
CA	Sacramento Co	1,551	36	22,616	504
CA	Shasta Co	531	327	13,561	648
CA	Solano Co	716	5,815	10,125	413
CA	Sutter Co	293	5	7,492	631
CA	Tehama Co	306	2	7,705	104
CA	Yolo Co	450	381	12,517	871
CA	Yuba Co	169	39	4,214	282
		4,854	6,653	105,416	4,775

Sacramento Valley Intrastate AQCR

NOx	VOC	CO	SO2	PM10
126,335	128,779	904,756	11,507	110,191

SOURCE:

<http://www.epa.gov/air/data/nettier.html>

USEPA - AirData NET Tier Report

*Net Air pollution sources (area and point) in tons per year (1999)

Site visited on February 20, 2004